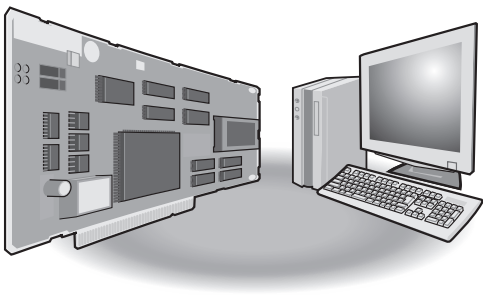
MITSUBISHI ELECTRIC

Mitsubishi PC Interface Board

MELSEC

Type Q80BD-J61BT11N/Q81BD-J61BT11 CC-Link System Master/Local Interface Board User's Manual (For SW1DNC-CCBD2-B)

-Q80BD-J61BT11N
-Q81BD-J61BT11



• SAFETY PRECAUTIONS •

(Be sure to read these instructions before using the product.)

Before using this product, read this manual and the relevant manuals introduced in this manual carefully and handle the product correctly with full attention to safety.
Note that these precautions apply only to this product. Refer to the user's manual of the CPU module for safety precautions on programmable controller systems.
In this manual, the safety instructions are ranked as "⚠ WARNING " and "⚠ CAUTION".

⚠ WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Note that failure to observe the ⚠CAUTION level instructions may also lead to serious results depending on the circumstances.
Be sure to observe the instructions of both levels to ensure personal safety.

Please keep this manual in accessible place and be sure to forward it to the end user.

[DESIGN PRECAUTIONS]

⚠ WARNING

- For details on the operating status of each station when a communication problem occurs in the data link, refer to Section 6.5 of this manual.
- If a cable dedicated to the CC-Link is disconnected, this may destabilize the line, and a data link communication error may occur in multiple stations. Make sure to create an interlock circuit in the sequence program so that the system will operate safely even if the above error occurs. Failure to do so may result in a serous accident due to faulty output or malfunctions.
- When performing the control of the personal computer in operation (changing data), configure an interlock circuit in a user program so the safety of the overall system is always maintained. When performing other controls of the personal computer in operation (changing program and operation status (status control)), read this manual carefully and confirm if the overall safety is maintained.
  Especially, when this control is performed to a remote personal computer from an external device, problems that have occurred on the personal computer side may not be able to immediately be handled if there is a data communication error.
  Define a troubleshooting agreement between external devices and the personal computer for data communication error occurrences, as well as construct an interlock circuit in the user program.
- Do not write any data from the user program into the "system area" of the board buffer memory. Writing data into the "system area" may cause a CC-Link system malfunction.
- A failure in the board may cause remote I/O not to turn on or off correctly.
  For critical I/O signals that may cause a serious accident, establish a circuit to externally monitor them.

[DESIGN PRECAUTIONS]

⚠ CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.
  They should be installed 100mm (3.94 in.) or more from each other.
  Not doing so could result in noise that may cause malfunction.

[INSTALLATION PRECAUTIONS]

⚠ CAUTION

- Use the board in an environment that meets the general specifications contained in this user's manual.
  Using this board in an environment outside the range of the general specifications may cause electric shock, fire, malfunction, and damage to or deterioration of the product.
- Do not directly touch the conductive area or electronic components of the board.
  Doing so may cause malfunction or failure in the board.
- Fix the board by tighten the board-fixing screws within the specified torque range.
  Under tightening may cause drop of the component or wire, short circuit, or malfunction.
  Over tightening may damage the screw and/or module, resulting in drop, short circuit, or malfunction.
  For the tightening torque of the board fixing screws, refer to the manual supplied with the personal computer.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the board.
  Failure to do so may cause a failure or malfunctions of the board.
- Be sure to shut off all phases of the external power supply used by the system before installing or removing the board. If all power is not turned off, not doing so may cause damage to the product.
- Install the board to a personal computer which is compliant with PCI standard or PCI Express® standard (Section 2.3). Failure to do so may cause a failure or malfunction.
- Securely mount the board to the PCI slot of the mounting device.
  If the board is not mounted correctly, this may lead to malfunctioning, failure or cause the board to fall.
- When mounting the board, take care not to become injured by the components that are installed or surrounding materials.
- When installing the board, take care not to contact with other boards.
- While handling the board, be sure to keep it free of static electricity.
  Static electric charges may damage the board or result in malfunction.
- Be sure to turn off the power supply to the applicable station before installing or removing the terminal block.
  If the terminal block is installed or removed without turning off the power supply to the applicable station, correct data transmission cannot be guaranteed.

[INSTALLATION PRECAUTIONS]

⚠ CAUTION

- Do not drop the board and the terminal block or subject it to any excessive shock.
  It may damage the board and the terminal block or result in malfunction.

[WIRING PRECAUTIONS]

⚠ CAUTION

- Be sure to shut off all phases of the external power supply used by the system before installing or removing the board and wiring.
  Not doing so may cause damage to the product.
- When turning on the power and operating the module after installation and wiring, always attach the computer's main cover.
  Failure to do so may cause an electric shock.
- When turning on the power and operating the module after wiring is completed, always attach the terminal cover that comes with the product.
  There is a risk of malfunction if the terminal cover is not attached.
- Always ground the SLD terminal of the board and the personal computer to the protective ground conductor.
  Not doing so can cause a malfunction.
- Tighten the terminal screws within the range of specified torque.
  If the terminal screws are loose, it may cause short circuits or malfunction.
  If the terminal screws are tightened too much, it may cause damage to the screw and/or the board, resulting in short circuits or malfunction.
- Prevent foreign matter such as swarf or wire chips from being attached onto the board.
  Failure to do so may cause fires, failure or malfunction.
- Be sure to fix the wires or cables connected to the board by placing them in a duct or clamping them.
  If not fixed, cables may be dangled and accidentally pulled, causing damage to the board and cables and malfunction due to bad cable contacts.
- Do not install the control lines together with the communication cables, or bring them close to each other. Doing so may cause malfunctions due to noise.
- When removing the communication cable or power supply cables from the board, do not pull the cable.
  First loosen the screws where the cable is connected to the board and then remove the cable.
  Pulling the cable that is connected to the board may cause damage to the board and cable or malfunction due to bad cable contacts.
- Solderless terminals with insulation sleeve cannot be used for the terminal block. It is recommended that the wiring connecting sections of the solderless terminals will be covered with a marking tube or an insulation tube.
- Be sure to turn off the power supply to the applicable station before installing or removing the terminal block.
  If the terminal block is installed or removed without turning off the power supply to the applicable station, correct data transmission cannot be guaranteed.

[WIRING PRECAUTIONS]

⚠ CAUTION

- Always make sure to power off the system in advance when removing the terminating resistor to charge the system. If the terminating resistor is removed and mounted while the system is energized, normal data transmission will not be guaranteed.
- Use applicable solderless terminals and tighten them with the specified torque.
  If any solderless spade terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- Be sure to tighten any unused terminal screws within a tightening torque range (0.66 to 0.89N·m).
  Failure to do so may cause a short circuit due to contact with a solderless terminal.

[START UP AND MAINTENANCE PRECAUTIONS]

⚠ CAUTION

- Do not dismantle or rebuild the board.
  Doing so could cause failure, malfunction, injury or fire.
- Be sure to shut off all phases of the external power supply used by the system before installing or removing the board.
  Not doing so may cause failure or malfunction of the board.
- Do not touch the terminal while the power is on.
  Doing so may cause malfunction.
- Be sure to shut off all phases of the external power supply used by the system before cleaning or retightening the terminal screws or module mounting screws.
  Not doing so may cause damage to the product.
- Fix the board by tighten the board-fixing screws within the specified torque range.
  Under tightening may cause drop of the component or wire, short circuit, or malfunction.
  Over tightening may damage the screw and/or module, resulting in drop, short circuit, or malfunction.
  For the tightening torque of the board fixing screws, refer to the manual supplied with the personal computer.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the board.
  Failure to do so may cause a failure or malfunctions of the board.

[DISPOSAL PRECAUTIONS]

⚠ CAUTION

- When disposing of this product, treat it as industrial waste.

• CONDITIONS OF USE FOR THE PRODUCT •

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

REVISIONS

* The manual number is written at the bottom left of the back cover.

Print date	* Manual number	Revision
Jun., 2005	SH (NA)-080527ENG-A	First Printing
Nov., 2005	SH (NA)-080527ENG-B	Correction Section 2.2.1, Section 8.4.1, Section 8.4.3, Chapter 9, Section 17.1.1
Jun., 2006	SH (NA)-080527ENG-C	Correction Section 2.2.4, Section 3.2, Section 8.6, Section 17.2.1
Mar., 2007	SH (NA)-080527ENG-D	Correction Generic Terms and Abbreviations, Section 2.2.1, Section 8.4.1, Section 10.1.2, Section 11.2, Section 11.4, Section 11.8 Addition Section 11.3.5, Section 11.3.6, Section 11.7
Oct., 2007	SH (NA)-080527ENG-E	Correction Generic Terms and Abbreviations, Section 1.1, Section 1.3, Section 2.2.1, Section 4.2.3, Chapter 7, Section 8.4.1, Section 9.1, Section 11.3, Section 17.1.4, Section 17.2.1, Section 17.3.1, Appendix 3.2, Section 8.4.2 to Section 8.4.3 → Section 8.4.3 to Section 8.4.4 Addition Section 8.4.2, Appendix 7
Jan., 2008	SH (NA)-080527ENG-F	Correction Precautions for use, Generic Terms and Abbreviations, Chapter 1, Section 2.2, Section 2.2.1, Section 2.2.3, Section 3.1, Section 4.2.1, Section 4.2.2, Section 4.2.3, Section 4.2.4, Section 4.4.5, Section 5.2, Section 5.2.2, Section 5.2.3, Section 5.2.4, Section 5.3, Section 5.3.1, Section 5.3.2, Section 6.1, Section 7.1.1, Section 7.1.2, Section 8.2.1, Section 8.2.2, Section 8.4.1, Section 8.6, Section 9.3.6, Section 9.3.7, Section 9.3.8, Section 9.3.11, Section 10.1.1, Section 10.1.2, Section 12.2.1, Section 12.5.1, Section 13.1.2, Section 13.2.2, Section 14.1.2, Section 14.2.2, Section 15.2.1, Section 16.2.1, Section 17.1.4, Section 17.2.1, Section 17.6, Appendix 3.1.2, Appendix 3.1.3

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Print date	* Manual number	Revision
May, 2008	SH (NA)-080527ENG-G	Model addition Q81BD-J61BT11 Correction Precautions for use, Generic Terms and Abbreviations, Product List, Section 1.1, Section 1.3, Section 2.1, Section 2.2.1, Section 2.2.2, Section 2.2.3, Section 2.2.4, Section 3.1, Section 3.2, Section 4.4.7, Section 5.2, Section 8.3, Section 8.4.1, Section 8.4.3, Section 8.4.4, Section 8.6, Section 8.7.2, Section 9.1.1, Section 10.1.2, Section 11.3, Section 12.1, Section 12.5.2, Section 13.1.1, Section 13.1.5, Section 13.2.1, Section 13.2.5,Section 14.1.1, Section 14.1.5, Section 14.2.1, Section 14.2.5,Section 15.1, Section 15.5.2, Section 16.1, Section 16.5.2, Section 17.1.3, Section 17.3.1, Section 17.3.2, Appendix 1.1,Appendix 1.2, Appendix 2.3, Appendix 3, Appendix 3.2 Addition Appendix 8.1, Appendix 8.2
Sep., 2008	SH (NA)-080527ENG-H	Correction Section 3.2
Oct., 2008	SH (NA)-080527ENG-I	Correction Generic Terms and Abbreviations, Section 3.3, Section 10.1.2
Jul., 2009	SH (NA)-080527ENG-J	Correction Chapter 7, Appendix 7,1, Appendix 8.1, Appendix 8.2
Oct., 2009	SH (NA)-080527ENG-K	Correction Section 2.2.1, Section 8.4.1, Section 10.1.2, Section 11.4, Section 17.1.1, Section 17.2.1, Section 17.3.1, Appendix 4.1, Appendix 4.2
May, 2010	SH (NA)-080527ENG-L	Correction SAFETY PRECAUTIONS, Generic Terms and Abbreviations, Section 1.1, Section 2.2.1, Section 3.1, Section 8.2.1, Section 8.3, Section 8.4, Section 8.6, Section 10.2.1, Section 11.3.3, Section 11.3.4, Section 11.9, Appendix 7, Section 1.3 → Appendix 8, Appendix 8 to Appendix 9 → Appendix 9 to Appendix 10 Addition CONDITIONS OF USE FOR THE PRODUCT Deletion Section 11.3.5, Section 11.3.6

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Print date	* Manual number	Revision
Dec., 2010	SH (NA)-080527ENG-M	Correction Section 2.2.1
May, 2011	SH (NA)-080527ENG-N	Correction Precautions for use, Manuals, Product List, Appendix 2.3, Appendix 7.2
Mar., 2012	SH (NA)-080527ENG-O	Correction Section 2.2.1, Section 8.4.1, Section 8.4.2 Appendix 10 changed to Appendix 12 Addition Appendix 10, Appendix 11
Apr., 2012	SH (NA)-080527ENG-P	Correction SAFETY PRECAUTIONS, Manuals, How to Read this Manual, Generic Terms and Abbreviations, Product List, Section 1.1, Section 2.2.1, Section 3.1, Section 4.4.7, Section 7.2.1, Section 7.4.1, Section 7.4.2, Section 8.1.1, Section 8.1.7, Section 8.3.3, Section 8.3.5, Section 8.3.6, Section 8.3.7, Section 8.3.8, Chapter 9, Section 9.2, Section 10.5.2, Section 11.1.5, Section 11.2.5, Section 12.2.5, Section 13.5.2, Section 14.5.2, Section 15.1.1, Section 15.1.4, Section 15.2.1, Section 15.3.5, Appendix 1.1, Appendix 3.1.4, Appendix 7.1, Appendix 8, Appendix 10, Appendix 12.1 Chapter 7 → Appendix 10, Chapter 8 to Chapter 9 → Chapter 7 to Chapter 8, Chapter 11 to Chapter 17 → Chapter 9 to Chapter 15, Appendix 9 to Appendix 12 → Appendix 11 to Appendix 14 Addition Appendix 9 Deletion Chapter 10, Section 11.3 to Section 11.9
Dec., 2012	SH (NA)-080527ENG-Q	Correction HOW TO USE THIS MANUAL, GENERIC TERMS AND ABBREVIATIONS, Section 7.7.2

* The manual number is written at the bottom left of the back cover.

Print date	* Manual number	Revision
Sep., 2013	SH (NA)-080527ENG-R	Correction SAFETY PRECAUTIONS, MANUALS, HOW TO USE THIS MANUAL, GENERIC TERMS AND ABBREVIATIONS, Section 1.1, Section 2.1, Section 2.3, Section 3.2.1, Section 3.4, Section , Section 4.3.4, Section 4.4.5, Chapter 5, Section 5.1 to 5.6, Section 6.1, Section 6.2.1, Section 6.2.2, Section 6.3.1, Section 6.3.2, Section 6.4.1, Section 6.4.2, Section Chapter 7, Section 7.1 to 7.3, Section 8.1 to 8.3, Section 9.1, Section 9.2, Section 10.2.1, Section 10.2.2, Section 10.5.1, Section 11.1.2, Section 11.2.2, Section 12.1.2, Section 12.1.3, Section 12.2.2, Section 12.2.3, Section 13.2.1, Section 13.2.2, Section 14.2.1, Section 14.2.2, Chapter 15, Chapter 16, Section 16.1 to 16.6, Section 2.1 changed 3.2.1, Section 2.2.1 changed 2.3, Section 2.2.2 changed 2.2, Chapter 7 changed Chapter 5, Section 5.2 changed 5.3, Section 7.7 changed 5.4.4, Section 7.8.1 changed 5.5, Section 7.8.2 changed 5.6, Section 7.4 changed Chapter 7, Section 7.4.1 changed 7.1, 16.2.3, Section 7.4.2 changed 7.3, Section 8.1.7 changed Appendix 10, Section 15.3.5 changed Chapter 15, Chapter 15 changed 16, Section 15.1.1 changed 16.1, Section 15.1.4 changed 16.3.2, Section 15.1.2 changed 16.4.3, Section 15.3, 15.3.1, 15.3.2 changed 16.5, Section 15.6 changed 16.6, Appendix 4, 4.1 changed 3.4, Section 2.2.4 changed Appendix 11, Appendix 4.2 changed 1, Section15.3.3 changed Appendix 2.1, Section 15.3.4 changed Appendix 2.2, Chapter 5 changed Appendix 3, Appendix 6 changed 4, Appendix 1 to 3 changed Appendix 5 to 7, Appendix 14 changed 8, Appendix 8 changed 9, Appendix 9 changed 10, Appendix 5 changed 12, Appendix 7 changed 15, Appendix 12 changed 16, Appendix 13 changed 17, Appendix 10 changed 18, Appendix 11 changed 19 Addition Section 5.3.3, Section 5.3.4, Section 5.4.3, Section 5.7, Section 6.5, Chapter 16, Section 16.2, Section 16.2.1, Section 16.2.2, Section 16.3, Section 16.3.3, Section 16.4, Section 16.4.1, Section 16.4.2, Appendix 13, Appendix 13.1, Appendix 13.2, Appendix 14, Appendix 16.3 Deletion Section 2.2.3, Section 5.2.1 to 5.2.4, Section 8.1.3 to 8.1.6, Section 15.1, Section 15.1.3 Section 15.2, Section 15.2.1, Section 15.3.3 to 15.3.5, Section 15.4, Section 15.5

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Print date	* Manual number	Revision
Jan., 2014	SH (NA)-080527ENG-S	Correction Section 16.3.2, Appendix 2
Jun., 2014	SH (NA)-080527ENG-T	Correction PRECAUTIONS FOR USE, GENERIC TERMS AND ABBREVIATIONS, Section 2.2, Section 2.3, Section 3.2.1, Section 4.3.4, Section 4.3.5, Section 4.3.7, Section 7.1, Section 7.2, Section 8.1.1, Section 8.2.8, Section 8.3.1, Section 8.3.2, Section 8.3.3, Section 8.3.5, Section 8.3.6, Section 8.3.8, Section 8.3.10, Section 16.1, Section 16.2.2, Section 16.2.3, Section 16.3.2, Appendix 13.2, Appendix 15.2, Appendix 16.2, Appendix 16.3, Appendix 17 Section 8.3.8 to Section 8.3.11 → Section 8.3.7 to Section 8.3.10 Deletion Section 8.3.7
Apr., 2015	SH (NA)-080527ENG-U	Correction Section 2.3, Section 3.4, Section 7.2, Section 16.3.2
Sep., 2015	SH (NA)-080527ENG-V	Correction Section 1.1, Section 1.2, Section 2.3, Section 4.1, Section 4.3.4, Section 4.3.5, Section 6.1, Section 6.2.1, Section 6.2.2, Section 6.3.1, Section 6.3.2, Section 6.4.1, Section 6.4.2, Section 7.1, Section 8.2.1, Section 8.2.2, Section 8.2.5, Section 10.2.2, Section 11.1.2, Section 11.2.2, Section 12.1.2, Section 12.1.3, Section 12.2.2, Section 12.2.3, Section 13.2.2, Section 14.2.2, Section 16.1, Section 16.2.3, Appendix 3.2, Appendix 5.2, Appendix 7.1.2, Appendix 7.2, Appendix 8.1, Appendix 14 Addition Section 4.3.6, Section 16.6 Section 16.6 → Section 16.7

Japanese Manual Version SH-080526-V

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PRECAUTIONS FOR USE

(1) Restrictions for functions depending on the personal computer or the operating system

There are some restrictions for the functions or supported versions depending on the operating system or personal computer to be used. For the operating environment, refer to Section 2.5.

(2) When using the CC-Link Ver.2 board as a standby master station

Refer to Section 2.2 for combinations of modules when using the CC-Link Ver.2 board as a standby master station.

(3) When using the CC-Link Ver.2 board as a master station

When using the CC-Link Ver.2 board as a master station, any of local modules cannot be used as a standby master station.

(4) Restrictions on the CC-Link Ver.2 board installation

Installing the CC-Link Ver.2 board and CC-Link Ver.1 board to the same computer and using both of them is not allowed.

(5) Installation

When a CC-Link Ver.2 board is used on a personal computer in which SWnDNF-CCLINK has been installed, uninstall SWnDNF-CCLINK first, then install the SW1DNC-CCBD2-B that is provided with the CC-Link Ver.2 board.

(6) Driver installation and updating

Do not install or update the driver other than the way written in the troubleshooting in this manual.

The consistency between the driver and utility cannot be identified, and CC-Link Ver.2 board may not operate properly.

(7) Software versions of the CC-Link system master and local modules

When reading/writing data from/to other stations using the transient transmission function in the CC-Link system, there is the restriction for the software version for the CC-Link master and local modules in the following table.

Model name	Software version	Remark
AJ61QBT11	Version N or later	Not accessible if the software version is M or earlier.
A1SJ61QBT11		
AJ61BT11		
A1SJ61BT11		

(8) Transient transmission functions of the CC-Link board

Transient transmission is not allowed to slave station No.64 on the CC-Link system.

(9) Performance

The system performance using the CC-Link Ver.2 board differs according to the performance/loaded condition of the personal computer, the processing contents of the application software, and the type of the interface board. Use the product after reviewing the system configuration and processing contents of the software in advance.
For details of the CC-Link Ver.2 board performance, refer to Appendix 3 DATA LINK PROCESSING TIMES.

(10) Combination of ROM version and S/W version

When using CC-Link Ver.2 board ROM version 2B or later, use S/W package version 1.06G or later.

INTRODUCTION

Thank you for purchasing the Type Q80BD-J61BT11N, Q81BD-J61BT11 CC-Link System Master/Local Interface Board.
Please read this manual and related manuals thoroughly to fully understand the functions and performances of the Type Q80BD-J61BT11N, Q81BD-J61BT11 CC-Link System Master/Local Interface Board in order to use the product properly.
Please be sure to deliver this manual to the end users.

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MANUALS

The following are the manuals related to this product.
Refer to the following tables when ordering required manuals.

Relevant Manuals

Manual Name	Manual Number (Model Code)
MELSEC-Q CC-Link System Master/ Local Module User's Manual This Manual explains system configuration, Performance specifications, functions, handling, wiring and troubleshooting for Q series master/local module. (Sold separately)	SH-080394 (13JR64)
CC-Link System Master/ Local Module type AJ61BT11/A1SJ61BT11 User's Manual This Manual explains system configuration, Performance specifications, functions, handling, wiring and troubleshooting for AJ61BT11 and A1SJ61BT11. (Sold separately)	IB-66721 (13J872)
CC-Link System Master/ Local Module type AJ61QBT11/A1SJ61QBT11 User's Manual This Manual explains system configuration, Performance specifications, functions, handling, wiring and troubleshooting for AJ61QBT11 and A1SJ61QBT11. (Sold separately)	IB-66722 (13J873)
MELSEC-L CC-Link System Master/ Local Module User's Manual This Manual explains system configuration, Performance specifications, functions, handling, wiring and troubleshooting for L series master/local module. (Sold separately)	SH-080895 (13JZ41)
MELSEC Data Link Library Reference Manual This manual explains programming, function specifications, and sample programming for MELSEC data link library. (Sold separately)	SH-081035ENG (13JV25)

REMARK

MELSEC Data Link Library Reference Manual is stored on the CD-ROM of the software package in a PDF file format.
Manuals in printed form are sold separately for a single purchase. Order a manual by quoting the manual number (model code) listed in the above table.

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HOW TO USE THIS MANUAL

The following lists the key items that represent the main usage of the CC-Link Ver.2 board by the purpose. Please use the following key items to refer to the appropriate section of this manual.

(1) To learn about the features of the CC-Link Ver.2 board (Chapter 1)

The features are described in Chapter 1.

(2) To learn about the system configuration (Chapter 2)

The system configuration using the CC-Link Ver.2 board is described in Chapter 2.

(3) To learn about specifications of the CC-Link Ver.2 board (Chapter 3)

The specifications of the CC-Link Ver.2 board are described in Chapter 3.

(4) To learn about the functions of the CC-Link Ver.2 board (Chapter 4)

The functions of the CC-Link Ver.2 board are described in Chapter 4.

(5) To learn about the settings and procedures up to operation of CC-Link Ver.2 board (Chapter 5)

The settings and procedures up to operation of the CC-Link Ver.2 board is described in Chapter 5.

(6) To learn about how to set parameters (Chapter 6)

How to set parameters is described in Chapter 6.

(7) To learn about how to install and uninstall utility software (Chapter 7)

How to install and uninstall utility software is described in Chapter 7.

(8) To learn about the utility software operating procedures (Chapter 8)

The utility software operating procedures are described in Chapter 8.

(9) To learn about MELSEC data link library (Chapter 9)

The overview of MELSEC data link library is described in Chapter 9.

(10) To learn about how to communicate with each station (Chapters 10 to 14)

Some examples of communication between the master board and each station are described in Chapters 10 to 14.

(11) To learn about the error descriptions (Chapter 15)

The descriptions of errors are described in Chapter 15.

(12) To learn about the corrective actions to take when the system does not operate (Chapter 16)

The troubleshooting procedures are described in Chapter 16.

GENERIC TERMS AND ABBREVIATIONS

This manual uses the following generic terms and abbreviations to describe the Model Q80BD-J61BT11N/Q81BD-J61BT11 CC-Link System Master/Local Interface Board, unless otherwise specified.

Generic term/abbreviation	Description of generic term/abbreviation
CC-Link Ver.1 board	Generic term for the Type A80BDE-J61BT11 CC-Link System Master/Local Interface Board and the Type A80BDE-J61BT13 Control & Communication Link System Local Interface Board.
CC-Link Ver.2 board	Abbreviation for the Type Q80BD-J61BT11N/Q81BD-J61BT11 CC-Link System Master/Local Interface Board.
Master board	Abbreviation for the CC-Link board when used as a master station.
Local board	Abbreviation for the CC-Link board when used as a local station.
QJ61BT11(N)	Generic term for QJ61BT11N CC-Link System Master/Local Module and QJ61BT11 CC-Link System Master/Local Module.
SW1DNC-CCBD2-B	Product name of the software package for CC-Link Ver.2 board.
Master station	The station controlling the remote station, local station, and intelligent device station.
Standby master station	Backup station for data link control when the link to the master station is disconnected due to a programmable controller CPU, Master board or power supply problem.
Local station	A station that has a CPU and can communication with the master station and local station.
Remote I/O station	A remote station that can only handle bit information. (AJ65BTB□-□□, AJ65BTC□-□□)
Remote device station	Remote station that can use bit data and word data. (Performs input and output with external devices, and analog data conversion.) (AJ65BT-64AD, AJ65BT-64DAV, AJ65BT-64DAI)
Remote station	Generic term for the remote I/O station and remote device station.
Intelligent device station	A slave station such as the AJ65BT-R2 in the CC-Link system that can perform transient transmission.
Slave station	Generic term for remote I/O station, remote device station, local station, intelligent device station and standby master station.
Ver.1 compatible slave station	Slave station compatible with the remote net ver.1 mode.
Ver.2 compatible slave station	Slave station compatible with the remote net ver.2 mode.
Master and local modules	Generic term for the AJ61QBT11, A1SJ61QBT11, AJ61BT11, A1SJ61BT11, QJ61BT11, LJ61BT11, L26CPU-BT, L26CPU-PBT, and RJ61BT11.
Master module	Generic term for the Master and local modules when they are used as master stations.
Local module	Generic term for the Master and local modules when they are used as local stations.
Remote module	Generic term for AJ65BTB□-□□, AJ65BTC□-□□, AJ65BT-64AD, AJ65BT-64DAV, AJ65BT-64DAI, A852GOT, etc.
Intelligent module	Generic term for modules such as the AJ65BT-R2 that can perform transient transmission.
Cyclic transmission	Function that periodically updates the contents of the remote I/O and remote register.
Transient transmission	Function by which data communications are available between 1:1stations at any given timing by specifying a target station.
Remote net mode	Mode that can communicate with all stations used for CC-Link (remote I/O station, remote device station, local station, intelligent device station, and standby master station) The remote net mode has three different modes: remote net ver.1 mode, remote net ver.2 mode, and remote net additional mode.
Remote net ver.1 mode	Mode in which compatibility with the CC-Link Ver.1 board is achieved. Select this mode when the number of cyclic points need not be increased or when the CC-Link Ver.2 board is used to replace the CC-Link Ver.1 board as a maintenance product.
Remote net ver.2 mode	Select this mode when increasing the number of cyclic points and configuring a new system.
Remote net additional mode	Select this mode when adding a ver.2 compatible station to the existing system to increase the number of cyclic points.
Board WDT	Abbreviation for the watchdog timer that monitors the operation of network board.
Driver WDT	Abbreviation for the watchdog timer that monitors the communication status between a network board and a personal computer, or operating status of a personal computer.

PACKING LIST

The following shows the product list of the CC-Link Ver.2 board.

Item name	Quantity
CC-Link system master/local interface board	1
Terminal resistor 110Ω, 1/2 W (brown-brown-brown)	2
Terminal resistor 130Ω, 1/2 W (brown-orange-brown)	2
Software package (CD-ROM) *1	1
Before Using the Product	1
Software License Agreement	1

*1: The manual is stored on the CD-ROM in a PDF file format.

1 OVERVIEW

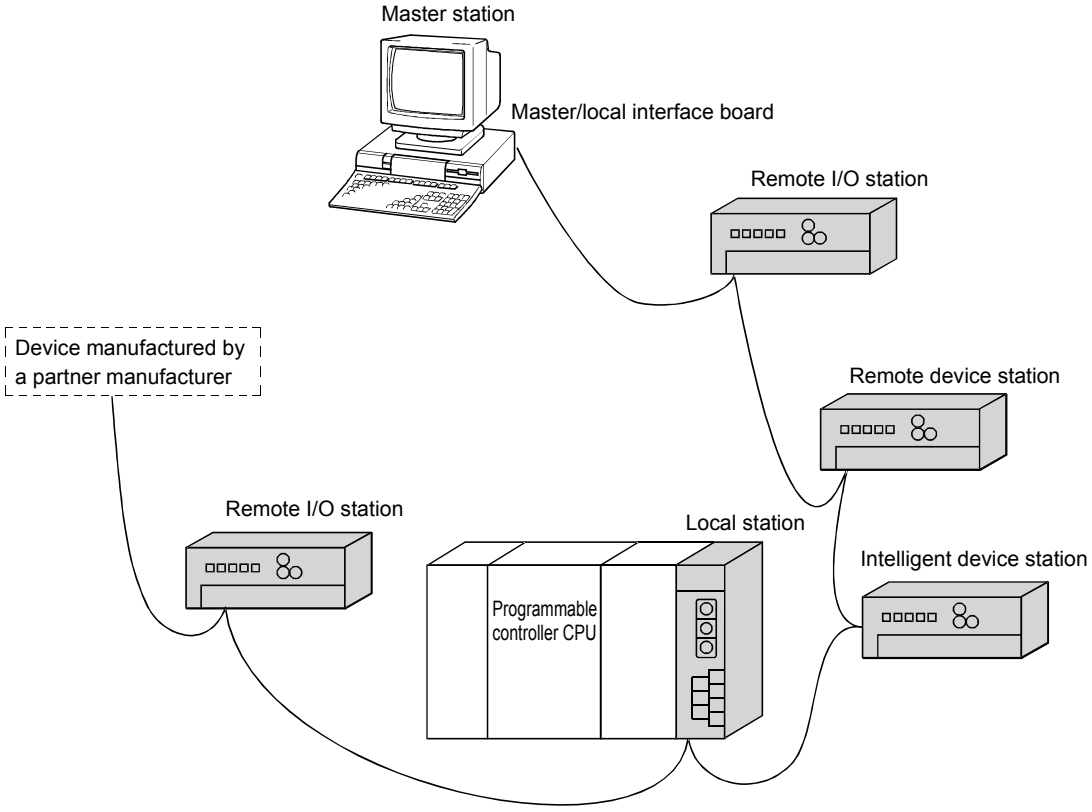
The CC-Link system connects distributed modules such as an I/O module and a special functional module using CC-Link dedicated cables so that these modules can be controlled by the programmable controller CPU.

(1) By distributing each module to facility equipment such as a conveyor line and a machine device, the entire system can be connected in the most efficient manner.

(2) The on/off information of input/output and numeric data handled by modules can easily be sent and received at high speed.

(3) A simple distributed system can be configured by connecting multiple personal computers and programmable controller CPUs.

(4) By connecting various devices made by Mitsubishi's partner manufacturers, the system that can provide flexible solutions to meet a wide range of user needs may be configured.



Master station	The station that controls the data link system.
Remote I/O station	A remote station that handles bit unit data only.
Remote device station	A remote station that handles bit unit and word unit data.
Local station	A station having a programmable controller CPU and the ability to communicate with the master and other local stations.
Intelligent device station	A station that can perform transient transmission.

When applying the program examples and sample programs explained in this manual to the actual system, make sure that there is no any problem regarding control on the target system.

1.1 Features of the CC-Link Ver.2 Board

The features of the CC-Link Ver.2 board are as follows:

(1) Personal computers can be incorporated into the CC-Link system.
Installing a CC-Link Ver.2 board into a personal computer allows the PC to be used as a master station, standby master station, or local station compatible with CC-Link Ver.2.
By using the CC-Link Ver.2 board as a master station, Ver.2 compatible remote I/O stations, remote device stations, intelligent device stations and local stations can be controlled from the PC.

(2) Programs in the CC-Link Ver.1 board can also be used in the CC-Link Ver.2 board.
Programs developed for the CC-Link Ver.1 board can be used for the CC-Link Ver.2 board.

(3) Parameters set for the CC-Link Ver.1 board can also be used for the CC-Link Ver.2 board.
Parameters set for the CC-Link Ver.1 board can be reused for the CC-Link Ver.2 board. (Refer to Appendix 7)

(4) PCI/PCI Express® is applicable.
For Q80BD-J61BT11N, PCI is applicable.
For Q81BD-J61BT11, PCI Express® is applicable.

(5) Parameters can easily be set.
The parameters necessary for the operation of the CC-Link system can easily be set with a CC-Link Ver.2 utility program; thus, programming is simplified.

(6) Test and monitoring information related to the CC-Link system can be displayed.
The test and monitoring states in the CC-Link system can be easily displayed on a personal computer.

(7) Support for a multiple CPU system
By specifying the logical station number via the CC-Link Ver.2 utility, a multiple CPU system can be accessed.

(8) It provides the functions that support user programming.
It is possible to perform the remote control of remote I/O stations, remote device stations, intelligent device stations, and local stations, as well as reading and writing of devices using the functions that support Microsoft® Visual C++® and Microsoft® Visual Basic® . Thus, user program can easily be created.
Example:
Control of the input signal X and output signal Y of a remote I/O station
Analogue voltage output control of a remote device station (analogue module)
Communication control of an intelligent device station (RS-232C module)

(9) It provides the drivers for various operating systems.
Various drivers are provided for easy system configuration according to the user environment.
For details on the compatible operating system, refer to Section 2.3.

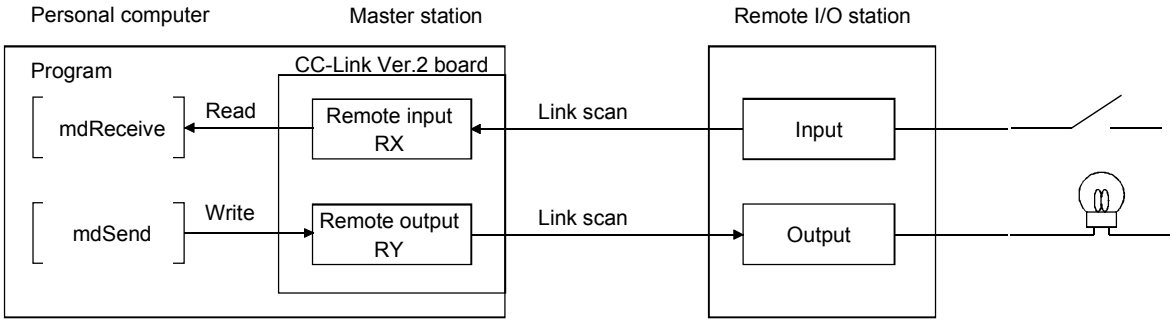
(10) Prevent separation of cyclic data by each station
In the CC-Link Ver.2 utility, cyclic data can be assured only by enabling the parameter of block data assurance per station setting.

1.2 Features of the CC-Link System

This section explains the features of the CC-Link System.

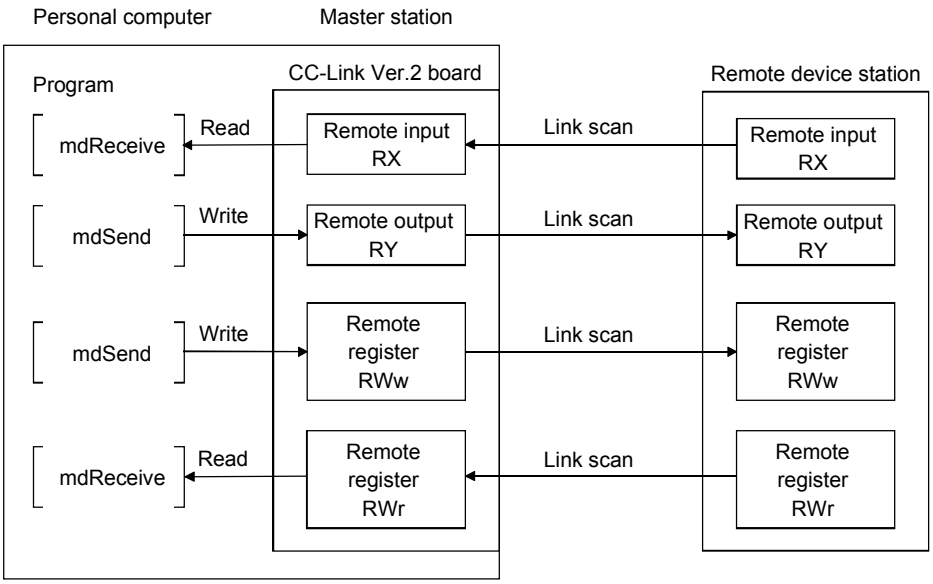
(1) Remote I/O station communication

The on/off status of a switch or indicator lamp is communicated using the remote input RX and remote output RY.



(2) Remote device station communication

Handshaking signals with the remote device station (initial request, error occurred flag, etc.) are communicated using the remote input RX and remote output RY. The setting data to the remote device station are communicated using the remote registers RWw and RWr.

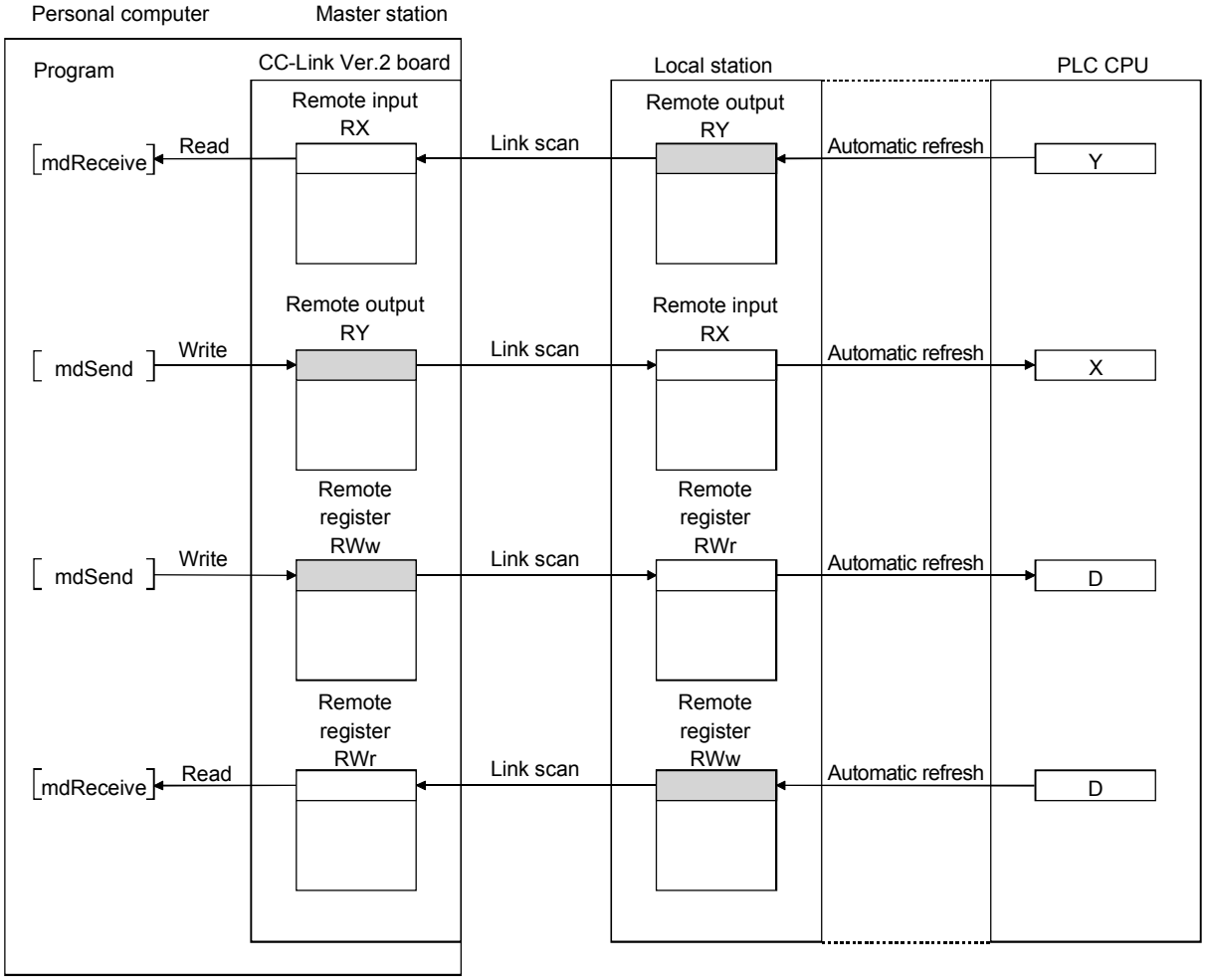


(3) Local station communication

The communication between the master station and the local station uses two types of transmission methods: cyclic transmission and transient transmission.

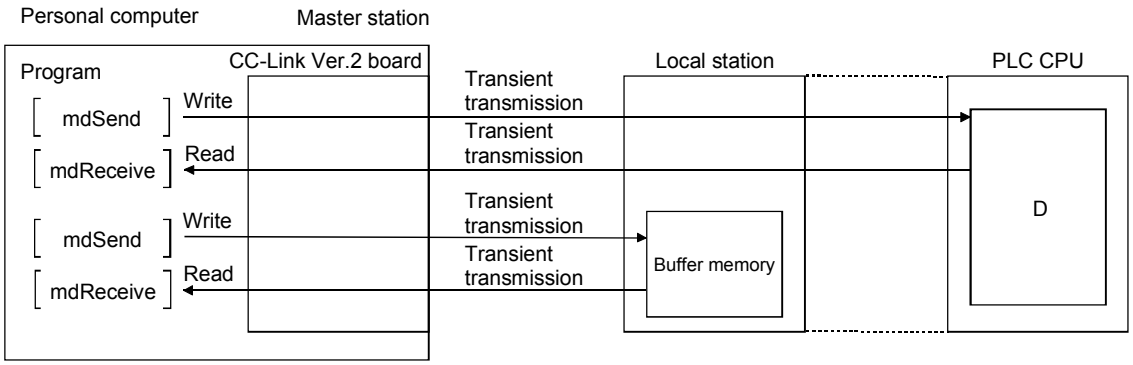
(a) Cyclic transmission

Data communication between stations can be performed in N : N mode using bit data (remote input RX and remote output RY) and word data (remote registers RWw and RWr).



(b) Transient transmission

Read and write operations can be performed for the local station buffer memory and CPU device at an arbitrary timing (using the mdReceive and mdSend functions, respectively).

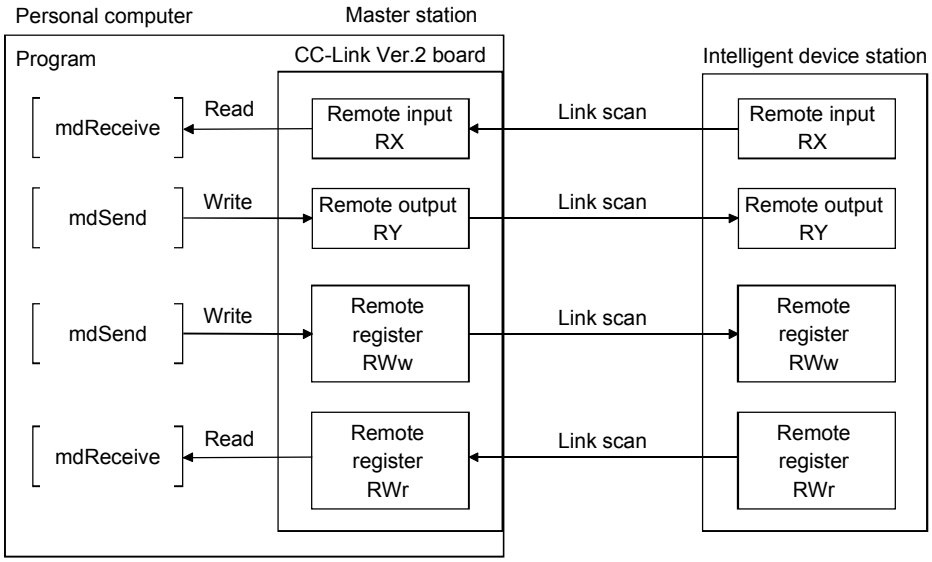


(4) Intelligent device station communication

The communication between the master station and the intelligent device station uses two types of transmission methods: cyclic transmission and transient transmission.

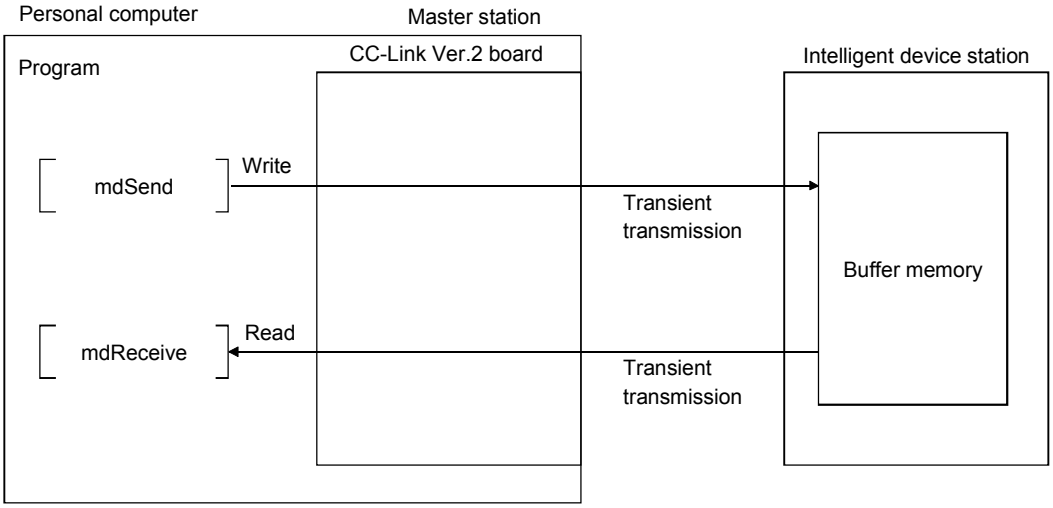
(a) Cyclic transmission

Handshaking signals with the intelligent device station (positioning start, positioning end, etc.) are communicated using the remote input RX and remote output RY. Numeric data (positioning start number, present feed value, etc.) is communicated using the remote registers RWw and RWr.



(b) Transient transmission

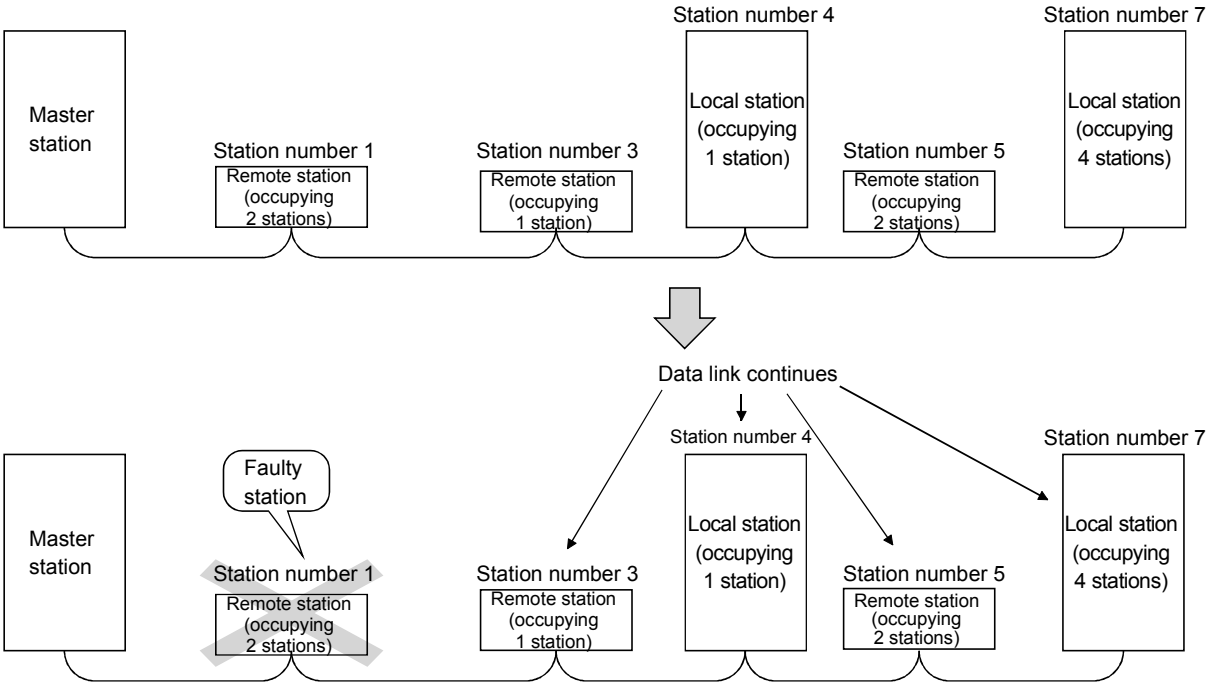
Read and write operations can be performed for the intelligent device station buffer memory at an arbitrary timing (using the mdReceive and mdSend functions, respectively).



(5) System down prevention (Slave station disconnect function)

Even if a module system fails because of power failure or power off, it will not affect the communication with other normal modules since the system employs the bus connection method.

Also, for a module using a 2-piece terminal block, the module can be replaced during data link. (Replace the module after turning its power off. Also check that the switch setting on the replaced module is same as the one set on the module before replacement.) However, if the cable is disconnected, the data link to all stations is disabled.



(6) Auto return function

When a module that has been disconnected from the link due to power off recovers and returns to the normal status, it will join the data link automatically.

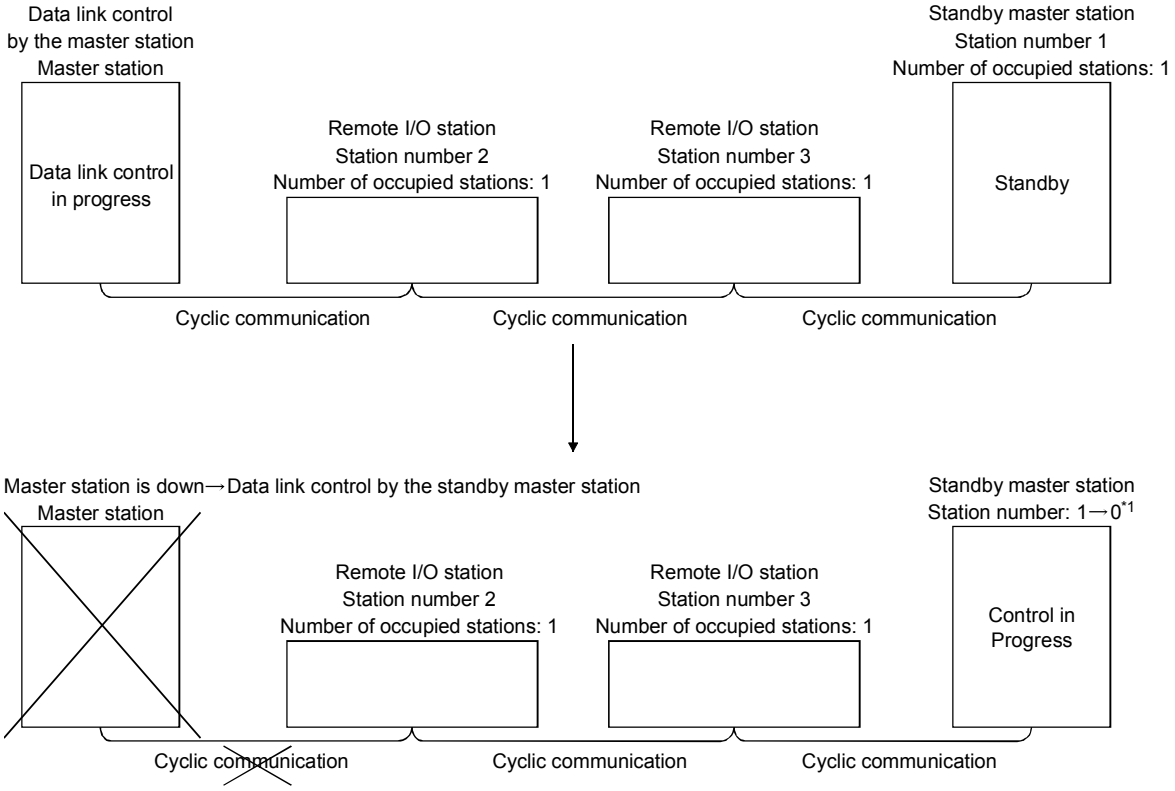
(7) Input data status setting from a data-link faulty station

The data entered (received) from a data-link faulty station can be cleared, or the status immediately before the error can be restored.

(8) Standby master function

This function enables the data link to continue working by switching to a standby master station (backup station for the master station) if a malfunction occurs in the master station.

POINT
The personal computer can be set as a standby master station only when the master station is also a personal computer. If the master station is a programmable controller CPU, the personal computer cannot be set as a standby master station.



*1: When the master station is down and the data link control is switched to the standby master station, the station number of the standby master station will be 0.

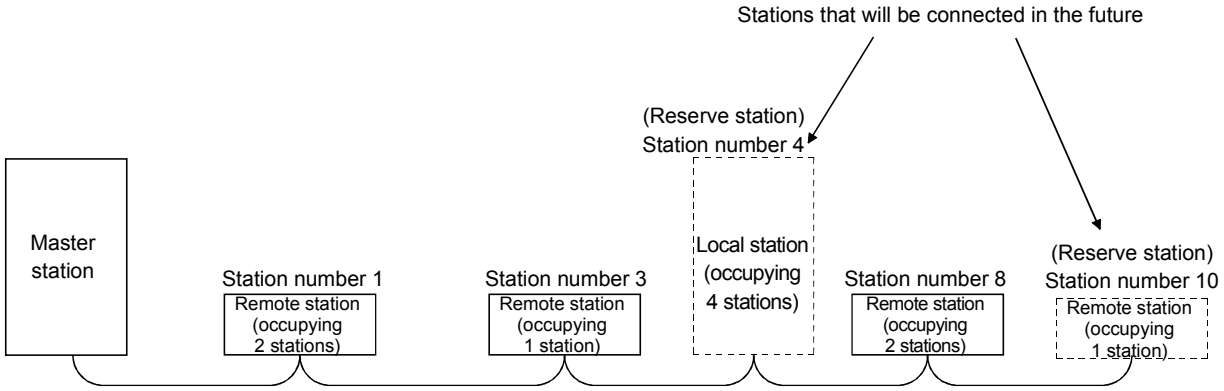
(9) Mode selection according to the system

The CC-Link system has 3 types of modes applicable to various systems. Select one of the modes on <<Parameter settings>> in the CC-Link Ver.2 utility.
Refer to Appendix 12 for the mode selection.
Each of the modes is described below.

Mode	Description	Connectable station
Remote net Ver.1 mode	The compatibility mode with the CC-Link Ver.1 board. Select this mode when the cyclic points increasing is not required or when the CC-Link Ver.2 board is used as substitute for the CC-Link Ver.1 board.	Remote I/O station Remote device station Intelligent device station Local station Standby master station
Remote net Ver.2 mode	Select this mode when configuring a new system with the cyclic points increasing.	
Remote net additional mode	Select this mode when adding a Ver.2 compatible slave station to the existing system to increase the number of cyclic points.	

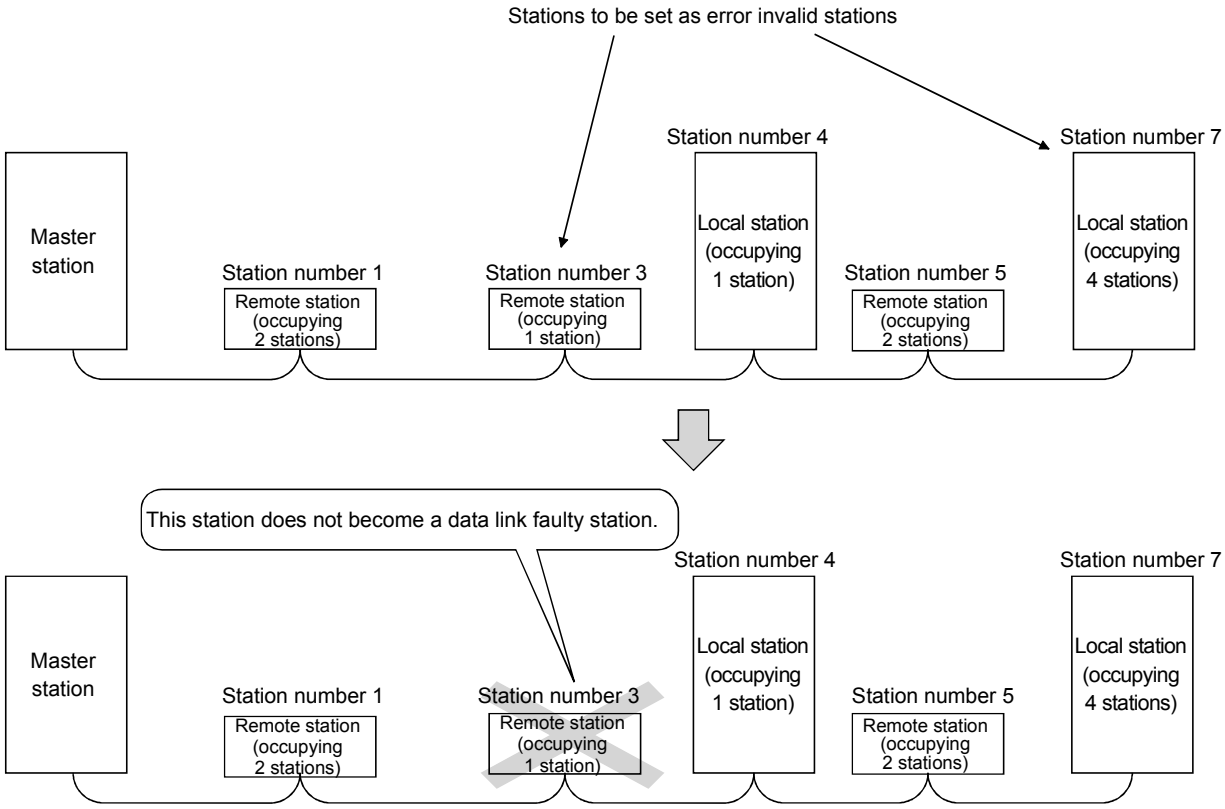
(10) Reserve station function

Stations that are not actually connected (stations to be connected in the future) will not be treated as faulty stations if they are specified as reserve stations.



(11) Error invalid station setting function

By setting network parameters, a module that is powered off in the system configuration will not be treated as a "data link faulty station" by the master station and local station. However, exercise caution since errors are no longer detected.


Stations to be set as error invalid stations
Station number 4
Station number 7
Master station
Station number 1
Remote station (occupying 2 stations)
Station number 3
Remote station (occupying 1 station)
Local station (occupying 1 station)
Station number 5
Remote station (occupying 2 stations)
Local station (occupying 4 stations)
This station does not become a data link faulty station.
Station number 4
Station number 7
Master station
Station number 1
Remote station (occupying 2 stations)
Station number 3
Remote station (occupying 1 station)
Local station (occupying 1 station)
Station number 5
Remote station (occupying 2 stations)
Local station (occupying 4 stations)

(12) Data link stop/restart function

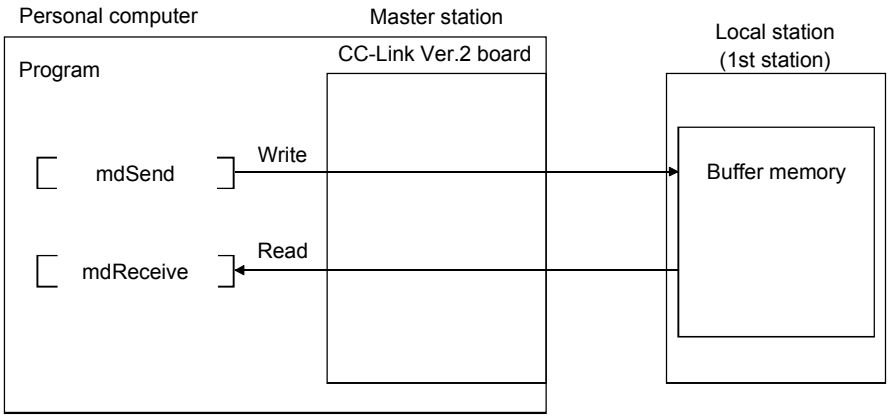
The data link can be stopped and restarted while it is being used.

(13) Duplicate station number check function

This is a transmission method by which data communications are available between 1:1stations at any given timing by specifying a target station.

(14) Transient transmission

In this method of transmission, a counterpart is specified and 1:1 communication is performed at an arbitrary timing.



(15) Backward compatibility

By setting the Remote net ver.1 mode, the user program of the CC-Link Ver.1 board can be used on the CC-Link Ver.2 board.
Select the remote net ver.1 mode when the cyclic points increasing is not required or when the CC-Link Ver.2 board is used as substitute for the CC-Link Ver.1 board.

(16) Cyclic points increase function

When the Remote net ver.2 mode or Remote net additional mode is selected, the number of cyclic points can be increased up to 8192 points for RX/RY and up to 2048 words for RWr/RWw per network by the expanded cyclic setting (single, double, quadruple or octuple).
Also, it can be increased up to 224 points for RX/RY and up to 32 words for RWr/RWw per station. (Refer to Section 4.4.7)

(17) Remote I/O station points setting

I/O points are set for remote I/O stations.
Since only the points used in remote input RX and remote output RY need to be set for remote I/O stations, the reserved points for the remote I/O stations can be reduced. This enables the minimum remote device allocation in the CC-Link system. (Refer to Section 4.4.6)

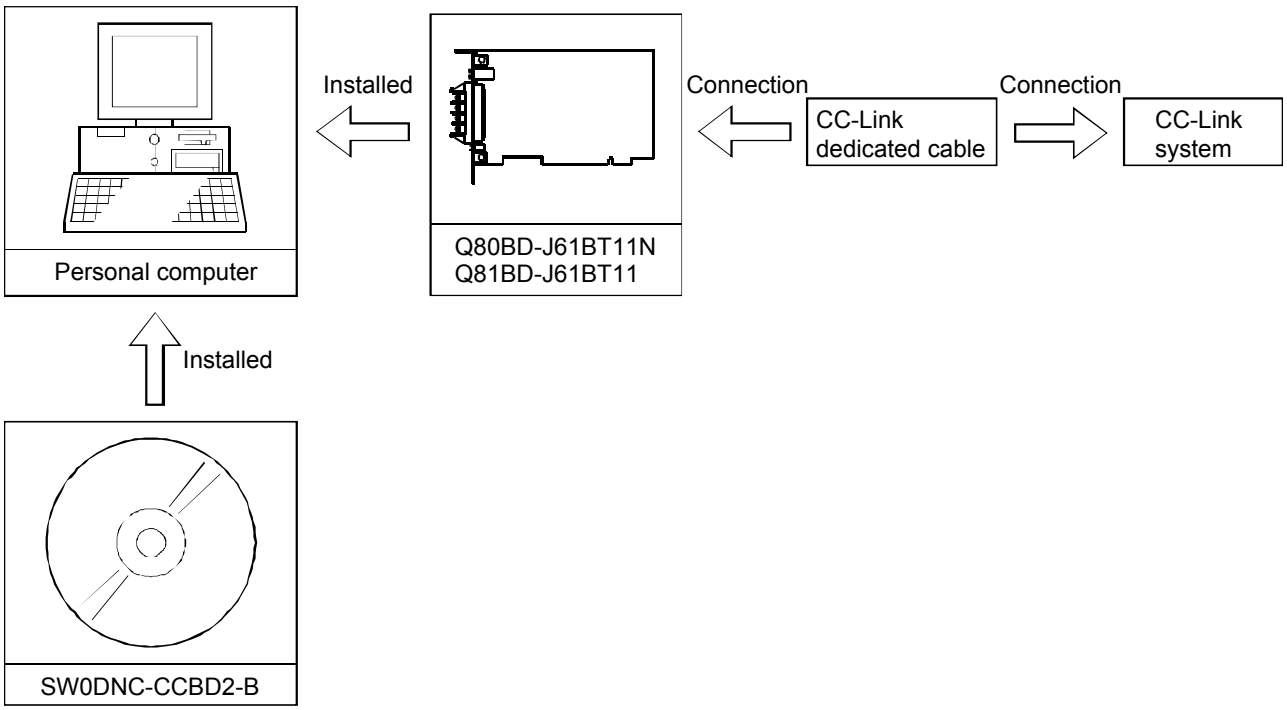
MEMO

1 - 10

2 SYSTEM CONFIGURATION

This chapter explains the system configuration of the CC-Link.

2.1 System Configuration Using CC-Link Ver.2 Board



2.2 Notes on the System Configuration

(1) Combinations of master and standby master stations

The following table shows the combination availability for the master station and standby master station in the system configuration.

Master station \ Standby master station		Q80BD-J61BT11N Q81BD-J61BT11			A80BD-J61BT11 A80BD-J61BT13	RJ61BT11*1 LJ61BT11 L26CPU-BT L26CPU-PBT QJ61BT11N			QJ61BT11 AJ61BT11 A1SJ61BT11 AJ61QBT11 A1SJ61QBT11
		Ver.2 Mode	Additional mode	Ver.1 Mode	Ver.1 mode	Ver.2 Mode	Additional mode	Ver.1 Mode	Ver.1 Mode
Q80BD-J61BT11N Q81BD-J61BT11	Ver.2 Mode	○	×	×	×	×	×	×	×
	Additional mode	×	○	×	×	×	×	×	×
	Ver.1 Mode	×	×	○	○	×	×	×	×
A80BD-J61BT11	Ver.1 Mode	×	×	○	○	×	×	×	×
RJ61BT11*1 LJ61BT11 L26CPU-BT L26CPU-PBT QJ61BT11N	Ver.2 Mode	×	×	×	×	○	×	×	×
	Additional mode	×	×	×	×	×	○	×	×
	Ver.1 Mode	×	×	×	×	×	×	○	○
QJ61BT11	Ver.1 Mode	×	×	×	×	×	×	○	○

○ : Available, × : Not available

*1: The additional mode is not supported.

(2) Incorporating the CC-Link Ver.1 board into the CC-Link Ver.2 network system

Use any of the following software versions to utilize the CC-Link Ver.1 board at a local station when the master station is in the remote net ver.2 mode or remote net additional mode.

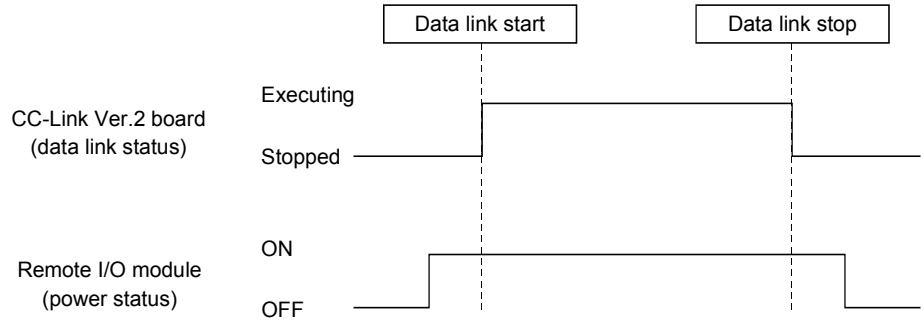
- A80BDE-J61BT11: Version "R" or later
- A80BDE-J61BT13: Version "Y" or later

Refer to Appendix 10 for how to check the software version.

(3) System design to prevent erroneous inputs from the remote I/O modules

(a) When powering on and off

Start the data link after turning on the power to the remote I/O modules.
Turn off the power to the remote I/O modules after stopping the data link.



(b) During momentary power failure of the remote I/O modules

When a momentary power failure occurs in the power being supplied to the remote I/O modules (24 V DC), an erroneous input may occur.

[Cause for erroneous inputs due to a momentary power failure]

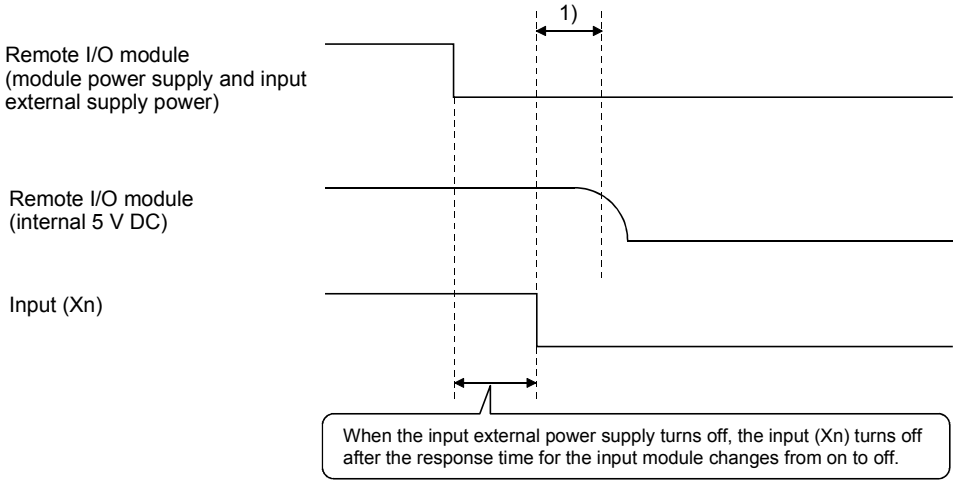
The remote I/O module hardware uses the power by internally converting the module power (24 V DC) to 5 V DC.

When a momentary power failure occurs in a remote I/O module, the following situation occurs:

(Time for the 5 V DC power in the remote I/O module to turn off)

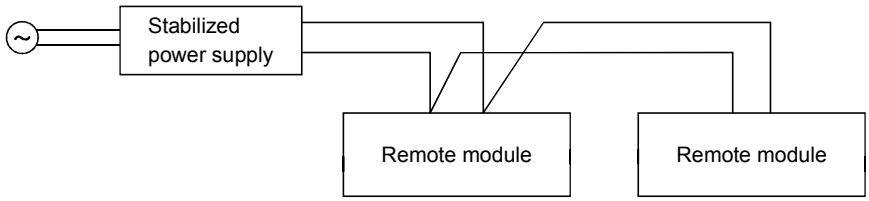
> (Response time for input module on → off)

Thus, an erroneous input occurs when a refresh is performed within the time indicated by 1) in the figure below.


1)
Remote I/O module
(module power supply and input
external supply power)
Remote I/O module
(internal 5 V DC)
Input (Xn)
When the input external power supply turns off, the input (Xn) turns off
after the response time for the input module changes from on to off.

REMARK

When supplying power from a single power source to multiple remote I/O modules, select the proper type of cable and perform wiring by considering the voltage drop. Connections can be established if the receiving port voltage at the remote I/O module is within the specified range of the remote I/O module to be used.



(4) Access to slave station No.64

When the CC-Link Ver.2 board is used, transient transmission to slave station No.64 is not allowed.

REMARK

(1) Access to slave station No.64 is not possible even from GX Developer, GX Works2 or GOT on any other station.
(2) Cyclic transmission can be normally performed with slave station No.64.

2.3 Operating Environment

The following table shows the operating environment for CC-Link Ver.2 board.
For details on the personal computer and operating system, refer to the instructions on the following pages.

Item		Description
Personal computer		Windows® supported personal computer
	CPU	System requirements of the operating system must be met.
	Required memory	
	PCI bus specifications	For Q80BD-J61BT11N • Compliant with PCI standard Rev.2.2 (5V DC, 32-bit bus, Basic clock : 33MHz)
	PCI Express® bus specifications	For Q81BD-J61BT11 • Compliant with PCI Express® standard Rev.1.0a (3.3 V DC, Link width : 1lane, Basic clock : 100MHz)
Operating system (English version) ＊1＊2		Microsoft® Windows NT® Workstation Operating System Version 4.0, Service Pack3 or higher ＊3 Microsoft® Windows® 2000 Professional Operating System ＊3
		Microsoft® Windows® XP Professional Operating System ＊5 Microsoft® Windows® XP Home Edition Operating System ＊5 Microsoft® Windows Server® 2003 R2, Standard Edition Operating System ＊5 Microsoft® Windows Server® 2003 R2, Enterprise Edition Operating System ＊5 Microsoft® Windows Server® 2003 R2, Standard x64 Edition Operating System ＊5 Microsoft® Windows Server® 2003 R2, Enterprise x64 Edition Operating System ＊5 Microsoft® Windows Vista® Home Basic Operating System ＊5 Microsoft® Windows Vista® Home Premium Operating System ＊5 Microsoft® Windows Vista® Business Operating System ＊5 Microsoft® Windows Vista® Ultimate Operating System ＊5 Microsoft® Windows Vista® Enterprise Operating System ＊5 Microsoft® Windows Server® 2008 Standard Operating System ＊5 Microsoft® Windows Server® 2008 Enterprise Operating System ＊5 Microsoft® Windows Server® 2008 Standard x64 Edition Operating System ＊5 Microsoft® Windows Server® 2008 Enterprise x64 Edition Operating System ＊5
		Microsoft® Windows Server® 2008 R2, Standard Operating System Microsoft® Windows Server® 2008 R2, Enterprise Operating System Microsoft® Windows® 7 Home Premium (32-bit version / 64-bit version) Operating System Microsoft® Windows® 7 Professional (32-bit version / 64-bit version) Operating System Microsoft® Windows® 7 Ultimate (32-bit version / 64-bit version) Operating System Microsoft® Windows® 7 Enterprise (32-bit version / 64-bit version) Operating System Microsoft® Windows Server® 2012 , Standard Operating System Microsoft® Windows Server® 2012 R2 , Standard Operating System Microsoft® Windows® 8 (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8 Pro (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8 Enterprise (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8.1 (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8.1 Pro (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8.1 Enterprise (32-bit version / 64-bit version) Operating System
Display		Resolution: 800×600 dot or higher (Recommended: 1024×768 dot)
Available hard disk space		1GB or more
Disk drive		CD-ROM disk drive

Item	Description
Programming language (English version) ＊2 *4	Microsoft® Visual Basic® 5.0 Microsoft® Visual Basic® 6.0 Microsoft® Visual Basic® .NET 2003 Microsoft® Visual Studio® 2005 Visual Basic® Microsoft® Visual Studio® 2008 Visual Basic® Microsoft® Visual Studio® 2010 Visual Basic® Microsoft® Visual Studio® 2012 Visual Basic® Microsoft® Visual Studio® 2013 Visual Basic®
	Microsoft® Visual C++® 5.0 Microsoft® Visual C++® 6.0 Microsoft® Visual C++® .NET 2003 Microsoft® Visual Studio® 2005 Visual C++® Microsoft® Visual Studio® 2008 Visual C++® Microsoft® Visual Studio® 2010 Visual C++® Microsoft® Visual Studio® 2012 Visual C++® Microsoft® Visual Studio® 2013 Visual C++®

＊1: Windows XP (64-bit version) and Windows Vista (64-bit version) are not supported.
＊2: For a combination of the operating system and the programming language, refer to the Microsoft Knowledge Base.
＊3: Not supported by SW1DNC-CCBD2-B Version 1.13P or later. When using one of these operating system, use SW1DNC-CCBD2-B Version 1.12N or earlier. SW1DNC-CCBD2-B Version 1.12N and its supported manual are stored on the CD-ROM of this product. (Refer to Appendix 14)
＊4: When creating 64-bit version Visual Basic application to be used for the MELSEC data link library, use Visual Studio® 2010 or later because .NET Framework 4.0 or .NET Framework compatible with .NET Framework 4.0 is required.
＊5: Not supported by SW1DNC-CCBD2-B Version 1.17T or later. When using one of these operating system, use SW1DNC-CCBD2-B Version 1.16S or earlier. SW1DNC-CCBD2-B Version 1.16S and its supported manual are stored on the CD-ROM of this product. (Refer to Appendix 14)

(1) Instructions for personal computer

(a) PCI standard

When a personal computer which is not compliant with the PCI or PCI Express® standard is used, troubles caused by failures such as a contact failure or operation error may occur.

For details on the number of boards that can be installed, installation slot and occupied slots, refer to Section 3.2.

(b) The functions being added

Operating environment	Supported version
Multiprocessor	Version 1.06G or later

(2) Instructions for operating system

(a) Supported version of SW1DNC-CCBD2-B

Operating system	Supported version	
	Q80BD-J61BT11N	Q81BD-J61BT11
Windows NT®	Version 1.12N or earlier	Not supported
Windows® 2000	Version 1.12N or earlier	Version 1.06G to 1.12N
Windows® XP	Version 1.16S or earlier	Version 1.06G to 1.16S
Windows Vista®	Version 1.04E to 1.16S	
Windows Server® 2003 R2 (32-bit version)	Version 1.06G to 1.16S	
Windows Server® 2003 R2 (64-bit version)	Version 1.11M to 1.16S	
Windows Server® 2008 (32-bit version)	Version 1.08J to 1.16S	
Windows Server® 2008 (64-bit version)	Version 1.11M to 1.16S	
Windows® 7 (32-bit version)	Version 1.08J or later *1	
Windows Server® 2008 R2, Windows® 7 (64-bit version)	Version 1.11M or later *1	
Windows Server® 2012, Windows® 8	Version 1.13P or later	
Windows Server® 2012 R2, Windows® 8.1	Version 1.15R or later	

*1: When using SW1DNC-CCBD2-B Version 1.17 T or later, apply Service Pack1 and Windows® security update program KB3033929. Use SW1DNC-CCBD2-B Version 1.16S or earlier, if Service Pack1 and KB3033929 cannot be applied.
SW1DNC-CCBD2-B Version 1.16S and its supported manual are stored on the CD-ROM of this product. (Refer to Appendix 14)

(b) User authority

Log on as a user having administrator authority.
Installation, uninstallation and usage of utilities are available only by the administrator's authority.

(c) .NET Framework 3.5

When using one of the following operating system, .NET Framework 3.5 is required.

- Windows Server® 2012
- Windows Server® 2012 R2
- Windows® 8
- Windows® 8.1

Enable the .NET Framework 3.5 (including .NET 2.0 or 3.0) in "Turn Windows features on or off" on the control panel.

(d) Update Windows® 8.1

Updating Windows® 8.1 is not supported.
When updating Windows® 8.1, install SW1DNC-CCBD2-B with the software Version 1.15R or later after uninstalling the software package and updating Windows® 8.1.

(e) The functions cannot be used

The following functions of operating system cannot be used. If an attempt is made to use any of the following functions, this product may not operate normally.

- Activating the application with Windows® compatible mode.
- Simplified user switch-over
- Remote desktop
- Large font size (Advanced setting of screen property)
- DPI setting other than 100%
  (set the size of text and illustration other than [smaller-100%])
- Power save mode (Standby, Hibernate, Sleep)
- Fast startup
- The language switching function set by Regional and Language Options
- Windows XP Mode
- Windows Touch or Touch
- Modern UI
- Client Hyper-V
- Server Core Installation
- Upgrade the operating system

REMARK

- When exiting the operating system, always shut down the computer.
- The behavior of the board and the personal computer when the personal computer enters the power save mode differs according to the operating system.
  For details of error codes and messages when the power save mode set by a user or a program is entered, refer to Appendix 16.
- Upgrading the operating system is not supported. Install SW1DNC-CCBD2-B by following the procedure shown below.
  1) Uninstall SW1DNC-CCBD2-B.
  2) Upgrade the operating system.
  3) Install SW1DNC-CCBD2-B with the software version supporting the upgraded operating system.

(3) Instructions for user program

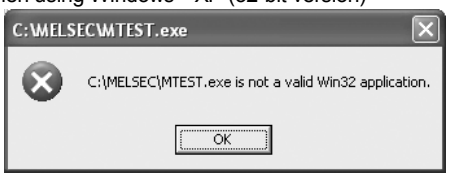
(a) Supported version of SW1DNC-CCBD2-B

User program	Supported version
32-bit version user program ∗1	All versions
64-bit version user program ∗2	Version 1.11M or later

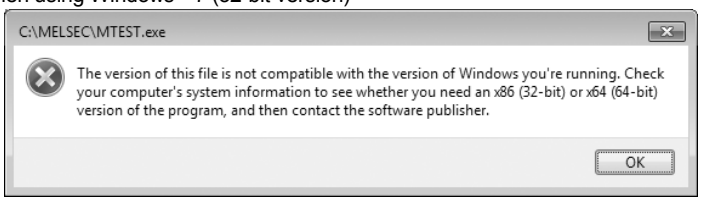
∗1: Programs can be created and executed on the 64-bit version operating system.

∗2: Programs can be created on the 32-bit version operating system, however, the following dialog box appears and cannot be executed.

<When using Windows® XP (32-bit version)>



<When using Windows® 7 (32-bit version)>


C:\MELSEC\MTEST.exe
The version of this file is not compatible with the version of Windows you're running. Check your computer's system information to see whether you need an x86 (32-bit) or x64 (64-bit) version of the program, and then contact the software publisher.
OK

(b) User programs created in the Japanese environment work only in the Japanese environment.

(c) User programs created in the English environment work only in the English environment.

3 SPECIFICATIONS

This chapter explains the specifications of CC-Link Ver.2 board.

3.1 General Specifications

The following table shows the general specifications of CC-Link Ver.2 board.

<table>
<tr><th>Item</th><th colspan="5">Specification</th></tr>
<tr><td>Operating ambient temperature</td><td colspan="5">0 to 55 ℃</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="5">-25 to 75 ℃</td></tr>
<tr><td>Operating ambient humidity</td><td colspan="5" rowspan="2">5 to 95 % RH, non-condensing</td></tr>
<tr><td>Storage ambient humidity</td></tr>
<tr><td rowspan="8">Vibration resistance</td><td rowspan="8">Compliant with JIS B 3502 and IEC 61131-2</td><td colspan="4">Under Intermittent vibration</td></tr>
<tr><td>Frequency</td><td>Constant acceleration</td><td>Half amplitude</td><td>Sweep count</td></tr>
<tr><td>5 to 8.4 Hz</td><td>—</td><td>3.5 mm</td><td rowspan="2">10 times each in X, Y, Z directions</td></tr>
<tr><td>8.4 to 150 Hz</td><td>9.8 m/s^2</td><td>—</td></tr>
<tr><td colspan="4">Under Continuous vibration</td></tr>
<tr><td>Frequency</td><td>Constant acceleration</td><td>Half amplitude</td><td>Sweep count</td></tr>
<tr><td>5 to 8.4 Hz</td><td>—</td><td>1.75 mm</td><td rowspan="2">—</td></tr>
<tr><td>8.4 to 150 Hz</td><td>4.9 m/s^2</td><td>—</td></tr>
<tr><td>Shock resistance</td><td colspan="5">Compliant with JIS B 3502 and IEC 61131-2 (147 m/s^2, 3 times each in X, Y, Z directions)</td></tr>
<tr><td>Operating atmosphere</td><td colspan="5">No corrosive gases</td></tr>
<tr><td>Operating altitude ＊1</td><td colspan="5">0 to 2000 m</td></tr>
<tr><td>Installation location</td><td colspan="5">Inside a control panel</td></tr>
<tr><td>Overvoltage category ＊2</td><td colspan="5">II or less</td></tr>
<tr><td>Pollution degree ＊3</td><td colspan="5">2 or less</td></tr>
</table>

＊1: Do not use or store the board under the environment where the atmospheric pressure is higher than the one at the altitude of 0 m. Doing so may cause a malfunction.

＊2: This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities.
The surge voltage withstand level for up to the rated voltage of 300V is 2500V.

＊3: This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.
Pollution degree 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

REMARK

General specifications both CC-Link Ver.2 board and a personal computer must be satisfied after installation.

3.2 Performance Specifications

Table 3.1 shows the performance specifications of the CC-Link Ver.2.

Table 3.1 Performance specifications

Item	Specification	
	Q80BD-J61BT11N	Q81BD-J61BT11
Transmission rate	Can select from 156 kbps / 625 kbps / 2.5 Mbps / 5 Mbps / 10 Mbps	
Overall cable distance (maximum transmission distance)	Varies according to the transmission rate (Refer to Section 3.2.2, 3.2.3)	
Maximum number of connected stations (master station)	64 (Refer to Section 3.2.1 for the conditions for the number of connected stations)	
Occupied station count (when mounted to local station)	In remote net ver.1 mode: 1 or 4 station(s) (Can be changed on <<Parameter settings>> in the CC-Link Ver.2 utility.) In remote net ver.2 mode, remote net additional mode: 1 to 4 station(s) (Can be changed on <<Parameter settings>> in the CC-Link Ver.2 utility.)	
Maximum number of link points per system ＊1	Remote I/O (RX, RY): 2048 points Remote register (RWw): 256 points (master station → remote station/local station/intelligent device station/standby master station) Remote register (RWr): 256 points (remote station/local station/ intelligent device station/standby master station → master station)	
Remote station/local station/intelligent device station/standby master station Number of link points per link ＊1	Remote I/O (RX, RY): 32 points (local station is 30 points) Remote register (RWw): 4 points (master station → remote station/local station/intelligent device station/standby master station) Remote register (RWr): 4 points (remote station/local station/intelligent device station/standby master station → master station)	
Communication method	Broadcast polling method	
Synchronous method	Frame synchronous method	
Encoding method	NRZI method	
Transmission path	Bus format (conforms to EIA RS-485)	
Transmission format	Conforms to HDLC	
Error control system	CRC ($X^{16} + X^{12} + X^5 + 1$)	
Connection cable	CC-Link dedicated cable/ CC-Link dedicated high performance cable/ Ver.1.10-compatible CC-Link dedicated cable ＊2	
RAS function	• Auto return function • Slave station disconnect function • Error detection by the link special relay/register	
Number of boards that may be used in one system	Maximum 4 ＊3	
Loading slot	PC PCI bus slot (half size)	PC PCI Express® X1, X2, X4, X8, X16 slot (half size)
Bus performance	PCI bus Bus width: 32 bits Bus clock frequency: 0 to 33MHz 5V DC ±5% PCI standard Rev.2.2	PCI Express® Link width: 1 lane Transmission speed: 2.5Gb/s 3.3V DC ±9% PCI Express® standard Rev.1.0a
Occupied slot	1 slot	
5 V DC internal current consumption	0.56A	—
3.3 V DC Internal current consumption	—	1.06A
Weight	0.11kg	0.11kg

*1: The link points shown above apply to the use in the remote net ver.1 mode.
Refer to Table 3.2 for those in the remote net ver.2 mode, remote additional mode.

*2: Ver.1.10-compatible CC-Link dedicated cables, CC-Link dedicated cables (Ver.1.00) and CC-Link dedicated high-performance cables cannot be used together. If used together, correct data transmission will not be guaranteed.
Also attach the terminating resister which matches the kind of the cable. (Refer to Section 5.4.1)

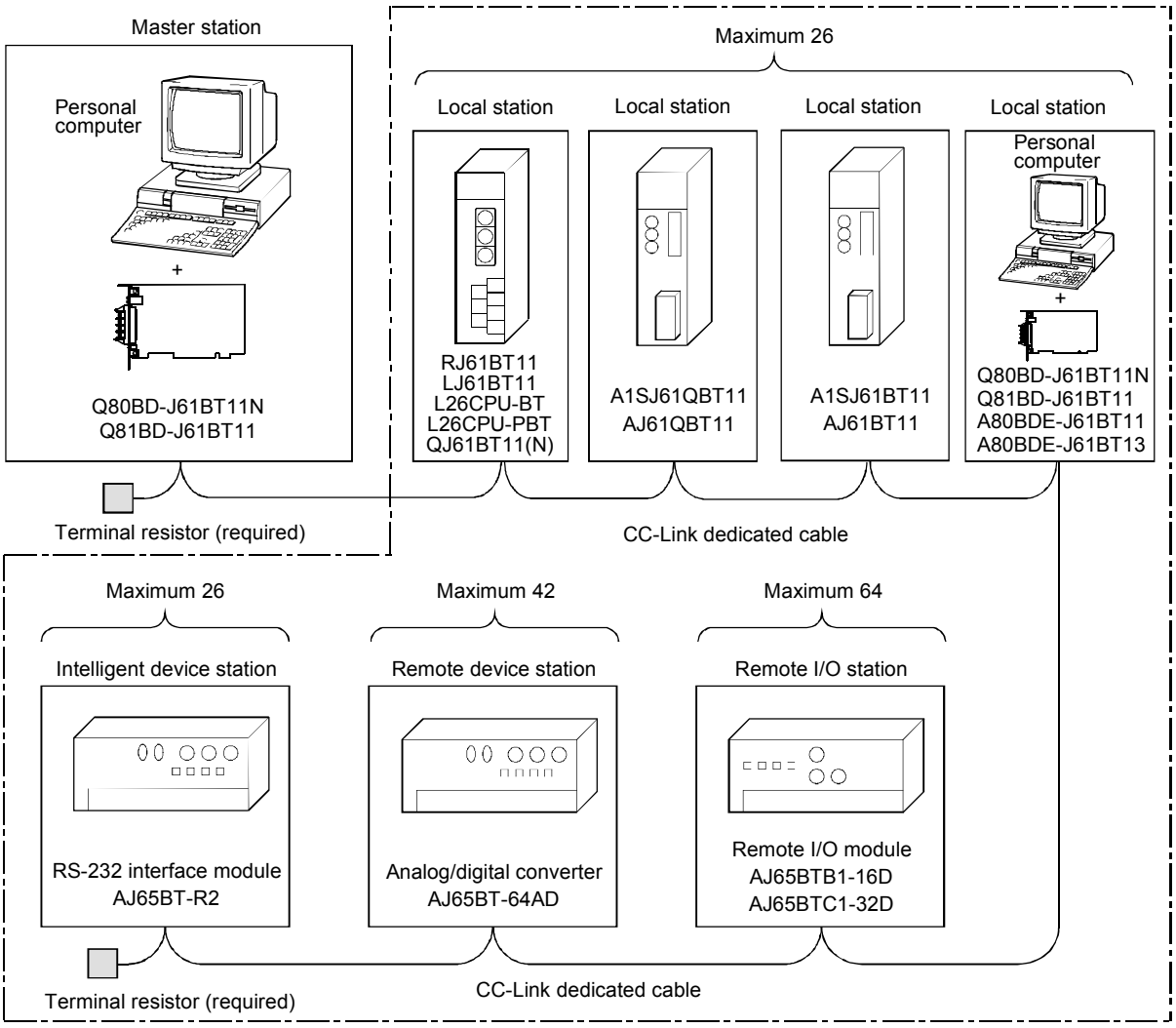
*3: Using the CC-Link Ver.2 board and the CC-Link Ver.1 board in the same computer is not allowed.

Table 3.2 Number of link points for remote net ver.2 mode/remote net additional mode

<table>
<tr><th colspan="3">Item</th><th colspan="4">Specifications</th></tr>
<tr><td colspan="3">Maximum No. of link points per system</td><td colspan="4">Remote I/O (RX, RY) : 8192 points
Remote register (RWw) : 2048 points (master station → remote device station/local station/intelligent device station/standby master station)
Remote register (RWr) : 2048 points (remote device station/local station/intelligent device station/standby master station → master station)</td></tr>
<tr><td rowspan="4">No. of link points per station</td><td colspan="2">Expanded cyclic setting</td><td>Single</td><td>Double</td><td>Quadruple</td><td>Octuple</td></tr>
<tr><td colspan="2">Remote I/O (RX, RY)</td><td>32 points
(30 points for local station)</td><td>32 points
(30 points for local station)</td><td>64 points
(62 points for local station)</td><td>128 points
(126 points for local station)</td></tr>
<tr><td colspan="2">Remote register (RWw)</td><td>4 points</td><td>8 points</td><td>16 points</td><td>32 points</td></tr>
<tr><td colspan="2">Remote register (RWr)</td><td>4 points</td><td>8 points</td><td>16 points</td><td>32 points</td></tr>
<tr><td rowspan="12">Number of link points per occupied station count</td><td rowspan="3">Occupies 1 station</td><td>Remote I/O (RX, RY)</td><td>32 points</td><td>32 points</td><td>64 points</td><td>128 points</td></tr>
<tr><td>Remote register (RWw)</td><td>4 points</td><td>8 points</td><td>16 points</td><td>32 points</td></tr>
<tr><td>Remote register (RWr)</td><td>4 points</td><td>8 points</td><td>16 points</td><td>32 points</td></tr>
<tr><td rowspan="3">Occupies 2 stations</td><td>Remote I/O (RX, RY)</td><td>64 points</td><td>96 points</td><td>192 points</td><td>384 points</td></tr>
<tr><td>Remote register (RWw)</td><td>8 points</td><td>16 points</td><td>32 points</td><td>64 points</td></tr>
<tr><td>Remote register (RWr)</td><td>8 points</td><td>16 points</td><td>32 points</td><td>64 points</td></tr>
<tr><td rowspan="3">Occupies 3 stations</td><td>Remote I/O (RX, RY)</td><td>96 points</td><td>160 points</td><td>320 points</td><td>640 points</td></tr>
<tr><td>Remote register (RWw)</td><td>12 points</td><td>24 points</td><td>48 points</td><td>96 points</td></tr>
<tr><td>Remote register (RWr)</td><td>12 points</td><td>24 points</td><td>48 points</td><td>96 points</td></tr>
<tr><td rowspan="3">Occupies 4 stations</td><td>Remote I/O (RX, RY)</td><td>128 points</td><td>224 points</td><td>448 points</td><td>896 points</td></tr>
<tr><td>Remote register (RWw)</td><td>16 points</td><td>32 points</td><td>64 points</td><td>128 points</td></tr>
<tr><td>Remote register (RWr)</td><td>16 points</td><td>32 points</td><td>64 points</td><td>128 points</td></tr>
</table>

3.2.1 Maximum number of connected modules

A CC-Link system can be configured with the number of modules meeting the following conditions.



(1) Remote net ver.1 mode

Condition 1	$\{(1 \times a) + (2 \times b) + (3 \times c) + (4 \times d)\} \leqq 64$	a: Number of modules occupying 1 station b: Number of modules occupying 2 stations c: Number of modules occupying 3 stations d: Number of modules occupying 4 stations
Condition 2	$\{(16 \times A) + (54 \times B) + (88 \times C)\} \leqq 2304$	A: Number of remote I/O stations $\leqq 64$ B: Number of remote device stations $\leqq 42$ C: Number of local stations, standby master stations and intelligent device stations $\leqq 26$

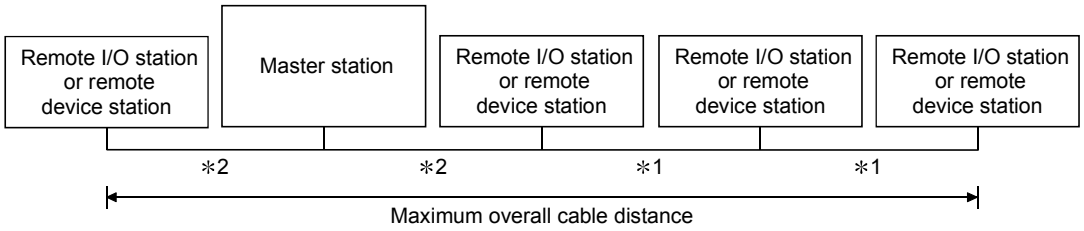
(2) Remote net ver.2 mode, remote net additional mode

Condition 1	{(a + a2 + a4 + a8) + (b + b2 + b4 + b8) × 2 + (c + c2 + c4 + c8) × 3 + (d + d2 + d4 + d8) × 4} ≦ 64	a: The total number of ver.1 compatible slave stations that occupy 1 station, and ver.2 compatible slave stations that occupy 1 station which are set to "Single". b: The total number of ver.1 compatible slave stations that occupy 2 stations, and ver.2 compatible slave stations that occupy 2 stations which are set to "Single". c: The total number of ver.1 compatible slave stations that occupy 3 stations, and ver.2 compatible slave stations that occupy 3 stations which are set to "Single". d: The total number of ver.1 compatible slave stations that occupy 4 stations, and ver.2 compatible slave stations that occupy 4 stations which are set to "Single". a2: The number of ver.2 compatible stations that occupy 1 station which are set to "Double". b2: The number of ver.2 compatible stations that occupy 2 stations which are set to "Double". c2: The number of ver.2 compatible stations that occupy 3 stations which are set to "Double". d2: The number of ver.2 compatible stations that occupy 4 stations which are set to "Double". a4: The number of ver.2 compatible stations that occupy 1 station which are set to “Quadruple”. b4: The number of ver.2 compatible stations that occupy 2 stations which are set to "Quadruple". c4: The number of ver.2 compatible stations that occupy 3 stations which are set to "Quadruple". d4: The number of ver.2 compatible stations that occupy 4 stations which are set to "Quadruple". a8: The number of ver.2 compatible stations that occupy 1 station which are set to "Octuple". b8: The number of ver.2 compatible stations that occupy 2 stations which are set to "Octuple". c8: The number of ver.2 compatible stations that occupy 3 stations which are set to "Octuple". d8: The number of ver.2 compatible stations that occupy 4 stations which are set to "Octuple".
Condition 2	[{(a × 32) + (a2 × 32) + (a4 × 64) + (a8 × 128)} + {(b × 64) + (b2 × 96) + (b4 × 192) + (b8 × 384)} + {(c × 96) + (c2 × 160) + (c4 × 320) + (c8 × 640)} + {(d × 128) + (d2 × 224) + (d4 × 448) + (d8 × 896)}] ≦ 8192	
Condition 3	[{(a × 4) + (a2 × 8) + (a4 × 16) + (a8 × 32)} + {(b × 8) + (b2 × 16) + (b4 ×+ 32) + (b8 × 64)} + {(c × 12) + (c2 × 24) + (c4 × 48) + (c8 × 96)} + {(d × 16) + (d2 × 32) + (d4 × 64) + (d8 × 128)}] ≦ 2048	
Condition 4	{(16 × A) + (54 × B) + (88 × C) } ≦ 2304	A: Number of remote I/O stations ≦ 64 B: Number of remote device stations ≦ 42 C: Number of local stations, standby master stations and intelligent device stations ≦ 26

3.2.2 Maximum overall cable distance (for Ver.1.00)

The relationship between the transmission speed and the maximum overall cable distance is described below:

(1) For a system consisting of only remote I/O stations and remote device stations



∗1: Cable length between remote I/O stations or remote device stations.
∗2: Cable length between the master station and the adjacent stations.

CC-Link dedicated cable (uses terminal resistor 110 Ω)

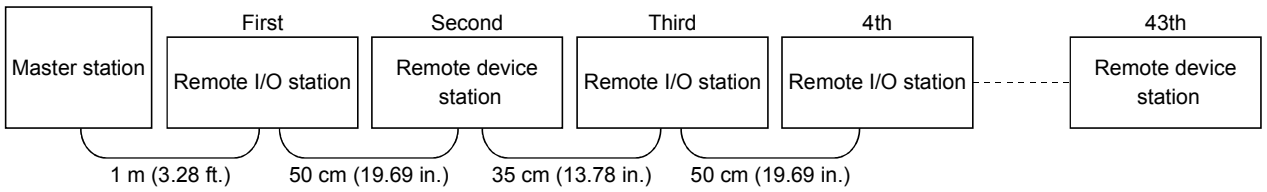
Transmission rate	Station-to-station cable length		Maximum overall cable distance
	∗1	∗2	
156 kbps	30 cm (11.81 in.) or more	1 m (3.28 ft.) or more	1200 m (3937.2 ft.)
625 kbps			600 m (1968.6 ft.)
2.5 Mbps			200 m (656.2 ft.)
5 Mbps	30 cm (11.81 in.) to 59 cm (23.23 in.)∗3		110 m (360.9 ft.)
	60 cm (23.62 in.) or more		150 m (492.15 ft.)
10 Mbps	30 cm (11.81 in.) to 59 cm (23.23 in.)∗3		50 m (164.1 ft.)
	60 cm (23.62 in.) to 99 cm (38.98 in.)∗3		80 m (262.5 ft.)
	1 m (3.28 ft.) or more		100 m (328.1 ft.)

CC-Link dedicated high performance cable (uses terminal resistor 130 Ω)

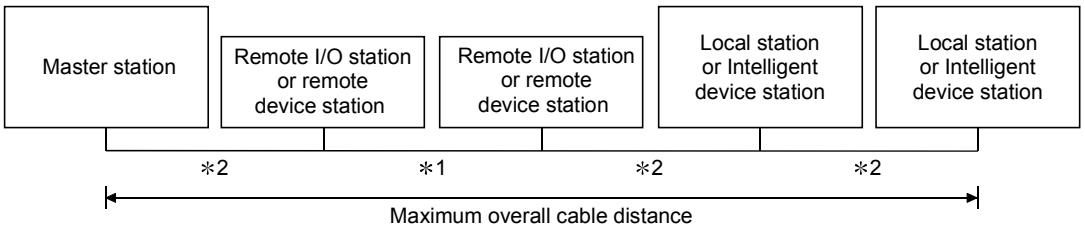
Transmission rate		Station-to-station cable length		Maximum overall cable distance
		∗1	∗2	
156 kbps		30 cm (11.81 in.) or more	1 m (3.28 ft.) or more	1200 m (3937.2 ft.)
625 kbps				900 m (2952.9 ft.)
2.5 Mbps				400 m (1312.4 ft.)
5 Mbps				160 m (524.96 ft.)
10 Mbps	Number of connected stations: 1 to 32			100 m (328.1 ft.)
	Number of connected stations: 33 to 48	30 cm (11.81 in.) to 39 cm (15.35 in.)∗3		80 m (262.5 ft.)
		40 cm (15.75 in.) or more		100 m (328.1 ft.)
	Number of connected stations: 49 to 64	30 cm (11.81 in.) to 39 cm (15.35 in.)∗3		20 m (65.52 ft.)
		40 cm (15.75 in.) to 69 cm (27.17 in.)∗3		30 m (98.43 ft.)
		70 cm (27.56 in.) or more		100 m (328.1 ft.)

∗3: The cable length between remote I/O stations or remote device stations is within this range and if even one location is wired, the maximum overall cable distance will be as indicated above.

(Example) When the transmission rate is 10 Mbps, and 43 remote I/O stations and remote device stations are connected using the CC-Link dedicated high performance cable, because the cable connecting the second and third stations is "35 cm (13.78 in.)", the maximum overall cable distance will be "80 cm (31.5 in.)".



(2) For a system consisting of remote I/O stations, remote device stations, local stations and intelligent device stations



∗1: Cable length between remote I/O stations or remote device stations
∗2: Cable length between the master station or the local or intelligent device station and the adjacent stations

CC-Link dedicated cable (uses terminal resistor 110 Ω)

Transmission rate	Station-to-station cable length		Maximum overall cable distance
	∗1	∗2	
156 kbps	30 cm (11.81 in.) or more	2 m (6.56 ft.) or more	1200 m (3937.2 ft.)
625 kbps			600 m (1968.6 ft.)
2.5 Mbps			200 m (656.2 ft.)
5 Mbps	30 cm (11.81 in.) to 59 cm (23.23 in.)∗3		110 m (360.9 ft.)
10 Mbps	60 cm (23.62 in.) or more		150 m (492.15 ft.)
	30 cm (11.81 in.) to 59 cm (23.23 in.)∗3		50 m (164.1 ft.)
	60 cm (23.62 in.) to 99 cm (38.98 in.)∗3		80 m (262.5 ft.)
	1 m (3.28 ft.) or more		100 m (328.1 ft.)

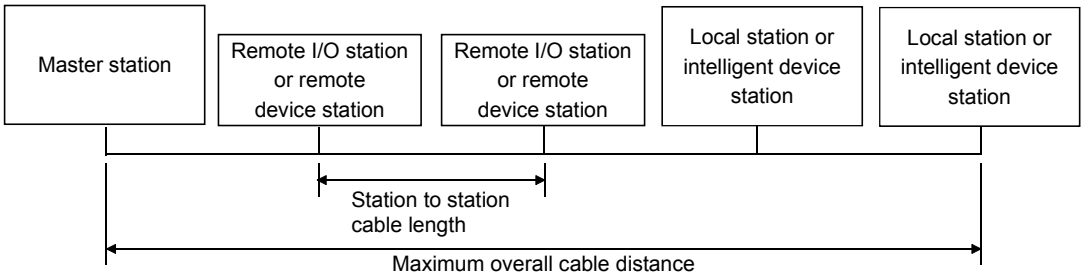
CC-Link dedicated high performance cable (uses terminal resistor 130 Ω)

Transmission rate	Station-to-station cable length		Maximum overall cable distance
	∗1	∗2	
156 kbps	30 cm (11.81 in.) or more	2 m (6.56 ft.) or more	1200 m (3937.2 ft.)
625 kbps			600 m (1968.6 ft.)
2.5 Mbps			200 m (656.2 ft.)
5 Mbps	30 cm (11.81 in.) to 59 cm (23.23 in.)∗3		110 m (360.9 ft.)
	60 cm (23.62 in.) or more		150 m (492.15 ft.)
10 Mbps	70 cm (27.56 in.) to 99 cm (38.98 in.)∗3		50 m (164.1 ft.)
	1 m (3.28 ft.) or more		80 m (262.5 ft.)

∗3: The cable length between remote I/O stations or remote device stations is within this range and if even one location is wired, the maximum overall cable distance will be as indicated above.

3.2.3 Maximum overall cable distance (for Ver.1.10)

The relation of the transmission speed and maximum overall cable distance when configuring the entire system with Version 1.10 modules and cable is shown below.


Master station
Remote I/O station or remote device station
Remote I/O station or remote device station
Local station or intelligent device station
Local station or intelligent device station
Station to station cable length
Maximum overall cable distance

Version 1.10 compatible CC-Link dedicated cable (terminal resistor of 110Ω used)

Transmission speed	Station to station cable length	Maximum overall cable distance
156kbps	20 cm (7.88 in) or longer	1200m (3937.2 ft)
625kbps		900m (2952.9 ft)
2.5Mbps		400m (1312.4 ft)
5Mbps		160m (524.96ft)
10Mbps		100m (328.1 ft)

3.3 CC-Link Dedicated Cable Specifications

Use the CC-Link dedicated cable for the CC-Link system. If a cable other than the CC-Link dedicated cable is used, the performance of the CC-Link system cannot be guaranteed.
If you have any questions regarding the CC-Link dedicated cable, or if you wish to see its specifications, refer to the CC-Link Partner Association homepage http://www.cc-link.org/.

REMARK

For details, refer to the CC-Link cable wiring manual issued by CC-Link Partner Association.

3.4 Buffer Memory List

"Buffer memory" is a memory area used for data transfer between the user program and the CC-Link Ver.2 board.
The data of the buffer memory return to their defaults when the CC-Link Ver.2 board is reset by powering OFF the PC or resetting the CC-Link Ver.2 Utility.

The buffer memory list is shown.

Address		Item	Description		Read/write possibility	Availability		Reference
Hexadecimal	Decimal					Master station	Local station	
0000_H to $00DF_H$	0 to 223	Use prohibited ＊1	—		—	—	—	—
$00E0_H$ to $0015F_H$	224 to 351	Remote input (RX) ＊2	For the master station:	Stores the input status from the remote/local/ intelligent device/standby master stations.	Read only	○	—	Appendix 1 (1)
			For the local station:	Stores the input status from the master station.		—	○	
0160_H to $01DF_H$	352 to 479	Remote output (RY) ＊2	For the master station:	Stores the output status to the remote/local/intelligent device/standby master stations.	Write only	○	—	
			For the local station:	Stores the output status to the master station. Also, stores the receive data from the remote/other local/intelligent device/ standby master stations.	Read/write enabled	—	○	

○: Available, — : Not available

＊1: Do not write to any area where use is prohibited. This may cause errors.
＊2: Used when the remote net ver.1 mode or remote net additional mode is selected.

Address		Item	Description	Read/write possibility	Availability		Reference
Hexadecimal	Decimal				Master station	Local station	
01E0H to 02DFH	480 to 735	Remote register (RWw) *2 Master station: For sending Local station: For sending/receiving	For the master station: Stores the send data to the remote device/all local/ intelligent device/standby master stations.	Write only	○	—	Appendix 1 (2)
			For the local station: Stores the send data to the master/other local/ intelligent device/standby master stations. Also, stores the receive data from the remote device/other local/ intelligent device/standby master stations.	Read/write enabled	—	○	
02E0H to 03DFH	736 to 991	Remote register (RWr) *2 Master station: For receiving Local station: For receiving	For the master station: Stores the receive data from the remote device/ local/intelligent device/ standby master stations.	Read only	○	—	Appendix 1 (2)
			For the local station: Stores the receive data from the master station.		—	○	
03E0H to 05DFH	992 to 1503	Slave station offset and size information	Stores offset and size information of RX/RY/RWw/RWr for each remote station, local station, intelligent device station, and standby master station.	Read only	○	○	Appendix 1 (5)
05E0H to 05FFH	1504 to 1535	Link special relay (SB)	Stores the data link status.	Read/write enabled (write may be disabled depending on the device)	○	○	Appendix 1 (3)
0600H to 07FFH	1536 to 2047	Link special register (SW)	Stores the data link status.				Appendix 1 (4)
0800H to 09FFH	2048 to 2559	Use prohibited *1	—	—	—	—	—
0A00H to 0FFFH	2560 to 4095	Random access buffer	The specified data is stored and used by transient transmission.	Read/write enabled	○	○	Appendix 1 (6)
1000H to 1FFFH	4096 to 8191	Use prohibited *1	—	—	—	—	—
2000H to 2FFFH	8192 to 12287	Automatic update buffer	Stores the automatic update data when performing transient transmission with the AJ65BT-R2 (communication using the automatic update buffer).	Read/write enabled	○	○	Appendix 1 (7)
3000H to 3FFFH	12288 to 16383	Use prohibited *1	—	—	—	—	—

○: Available, — : Not available

*1: Do not write to any area where use is prohibited. This may cause errors.

*2: Used when the remote net ver.1 mode or remote net additional mode is selected.

Address		Item	Description	Read/write possibility	Availability		Reference
Hexadecimal	Decimal				Master station	Local station	
4000_H to $41FF_H$	16384 to 16895	Ver.2 compatible remote input (RX) ＊3	For the master station: Stores the input status from the remote/local/ intelligent device/standby master stations.	Read only	○	—	Appendix 1 (8)
			For the local station: Stores the input status from the master station.		—	○	
4200_H to $43FF_H$	16896 to 17407	Ver.2 compatible remote output (RY) ＊3	For the master station: Stores the output status to the remote/local/intelligent device/standby master stations.	Write only	○	—	
			For the local station: Stores the output status from the master station. Also, stores the receive data from the remote/ other local/intelligent device/standby master stations.	Read/write enabled	—	○	
4400_H to $4BFF_H$	17408 to 19455	Ver.2 compatible remote register (RWw) ＊3 Master station: For sending Local station: For sending/receiving	For the master station: Stores the send data to the remote device/all local /intelligent device/standby master stations.	Write only	○	—	Appendix 1 (9)
			For the local station: Stores the send data to the master/other local/ intelligent device/standby master stations. Also, stores the receive data from the remote device/other local/ intelligent device/standby master stations.	Read/write enabled	—	○	
$4C00_H$ to $53FF_H$	19456 to 21503	Ver.2 compatible remote register (RWr) ＊3 Master station: For receiving Local station: For receiving	For the master station: Stores the receive data from the remote device/ other local/intelligent device/standby master stations.	Read only	○	—	
			For the local station: Stores the receive data from the master station.		—	○	
5400_H to $7FFF_H$	21504 to 32767	Use prohibited ＊1	—	—	—	—	—

○: Available, — : Not available

＊1: Do not write to any area where use is prohibited. This may cause errors.

＊3: Used when the remote net ver.2 mode or remote net additional mode is selected.

MEMO

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4 FUNCTIONS

This chapter explains the functions of the CC-Link Ver.2 board, dividing them into four sections: "Basic Functions," "Functions for Improving System Reliability," "Useful Functions" and "Transient Transmission Function."

4.1 Function List

(1) Table 4.1 lists the basic functions.

Table 4.1 List of the basic functions

Item	Description	Reference section
Communication with remote I/O station	Performs the communication of on/off information with remote I/O station.	Section 4.2.1
Communication with remote device station	Performs the communication of on/off information and numeric data with remote device station.	Section 4.2.2
Communication with local station	Performs the communication of on/off information and numeric data with local station.	Section 4.2.3
Communication with intelligent device station	Performs communication with intelligent device station via cyclic transmission and transient transmission.	Section 4.2.4

(2) Table 4.2 lists the functions for improving system reliability.

Table 4.2 List of the functions for improving system reliability

Item	Description	Reference section
Slave station disconnect function	Disconnects modules that cannot continue data link because of power off, etc, and continues the data link with only the normal modules.	Section 4.3.1
Auto return function	When a module, which has been disconnected from data link because of power off, etc, returns to the normal status, it automatically joins the data link.	Section 4.3.2
Input data status setting from data link faulty station	Sets the status (clear/latch) of the input (reception) data from a station that became data link faulty because of power off, etc.	Section 4.3.3
Standby master function	Continues data link by switching to the standby master station when a problem occurs in the master station.	Section 4.3.4
Driver WDT function	Monitors the operation of the software (operating system, driver) inside the hardware.	Section 4.3.5
Station-based block data assurance function	Prevent separation of cyclic data to new data and old data.	Section 4.3.6

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(3) Table 4.3 lists the useful functions.

Table 4.3 List of the useful functions

Item	Description	Reference section
Reserved station function	By assigning modules that will be connected in the future as reserved stations, these will not be treated as data link faulty stations. The reserved stations can also be set as 0 points. If any of the connected modules is designated as a reserved station, it cannot perform data link.	Section 4.4.1
Error invalid station setting function	Prevents modules that will be powered off in the system configuration from being treated as data link faulty stations by setting network parameters.	Section 4.4.2
Data link stop/restart	Stops or restarts the data link that is being executed.	Section 4.4.3
Station number duplicate check function	Checks for duplicate modules having the same station number in the system.	Section 4.4.4
Multiple CPU system support	Allows access to any CPU of a multiple CPU system via a CC-Link Ver.2 board.	Section 4.4.5
Remote I/O station point setting	Allows the I/O points of the remote I/O stations to be selected from among 8 points, 16 points and 32 points, reducing the number of reserved points.	Section 4.4.6
Cyclic points increase	Allows the number of cyclic points per module to be increased from 128 points for RX/RY and 16 points for RWr/RWw in the ver.1 mode to up to 896 points for RX/RY and 128 points for RWr/RWw in the ver.2 mode.	Section 4.4.7

(4) Table 4.4 lists the transient transmission function.

Table 4.4 List of the transient transmission function

Item	Description	Reference section
Transient transmission	Designates an opposite station and communicates at an arbitrary timing	Section 4.5.1

POINT

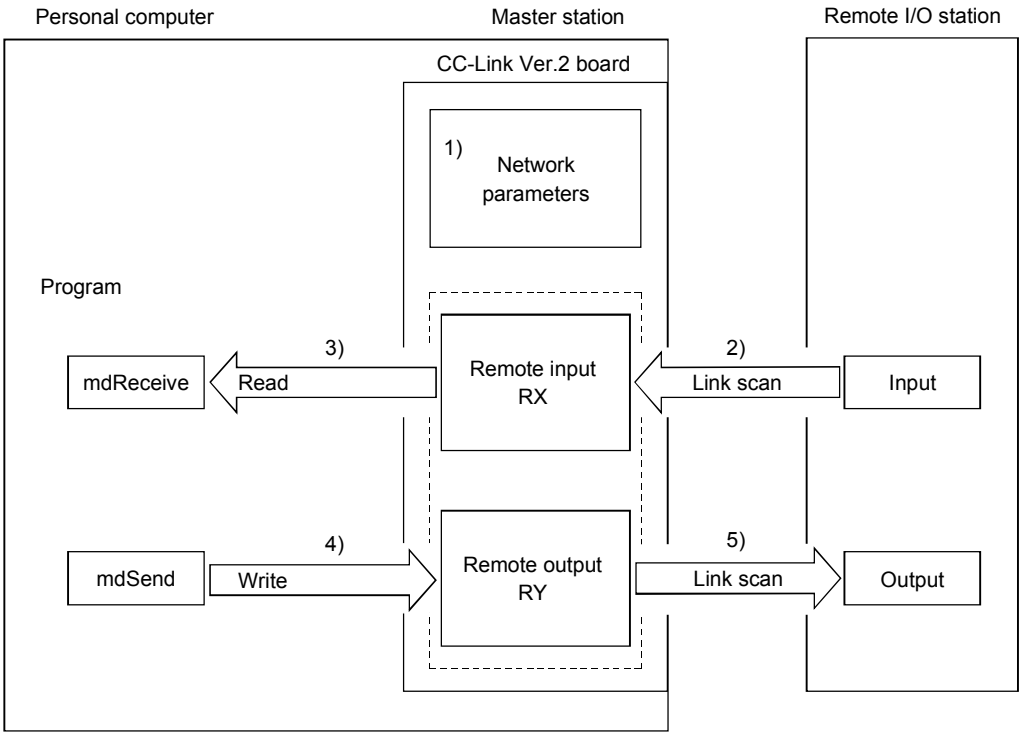
Refer to "Section 4.4.7 (3)(b) Whether send/receive is enabled or not" for the availability of cyclic data communication with the CC-Link Ver.2 compatible stations.

4.2 Basic Functions

This section explains the basic functions of the CC-Link Ver.2 board.

4.2.1 Communication with remote I/O stations

The following explains an overview of the communication between the master station and a remote I/O station. In the communication with the remote I/O station, the on/off information of the switches and indicator lamps are communicated via the remote input RX and remote output RY.



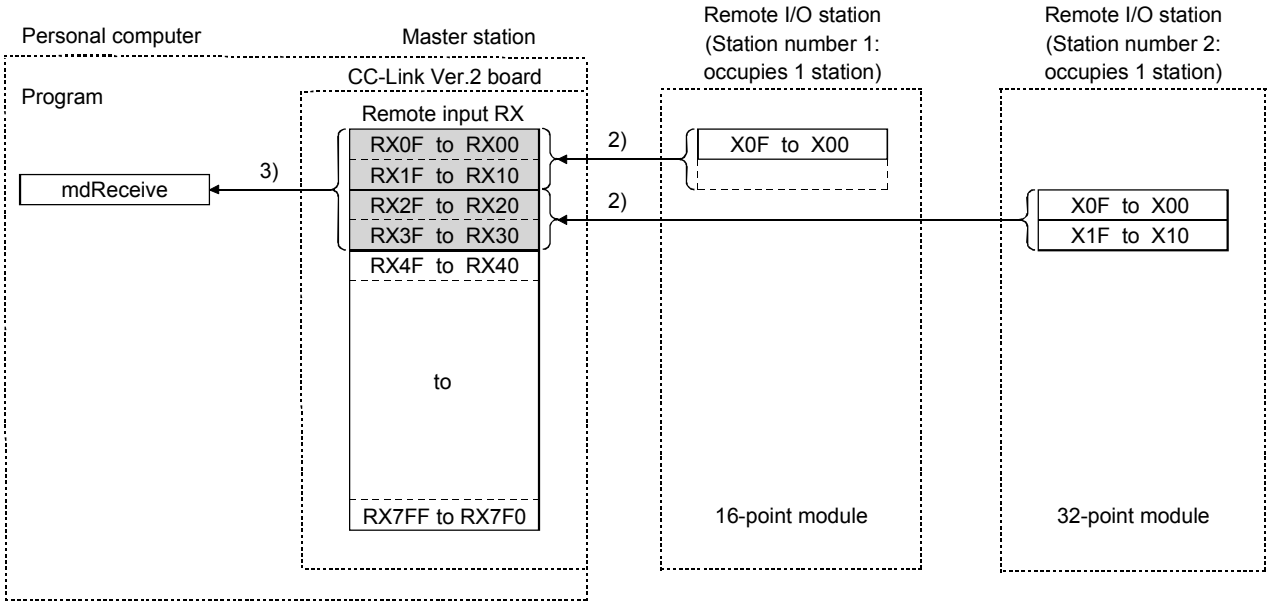
[Data link startup]

1) When the personal computer is powered on, the CC-Link system starts up in accordance with the network parameters set by the CC-Link Ver.2 utility.

[Remote input]

2) The input status of each of the remote I/O stations is automatically stored (for each link scan) in the master station's "remote input RX" buffer memory.

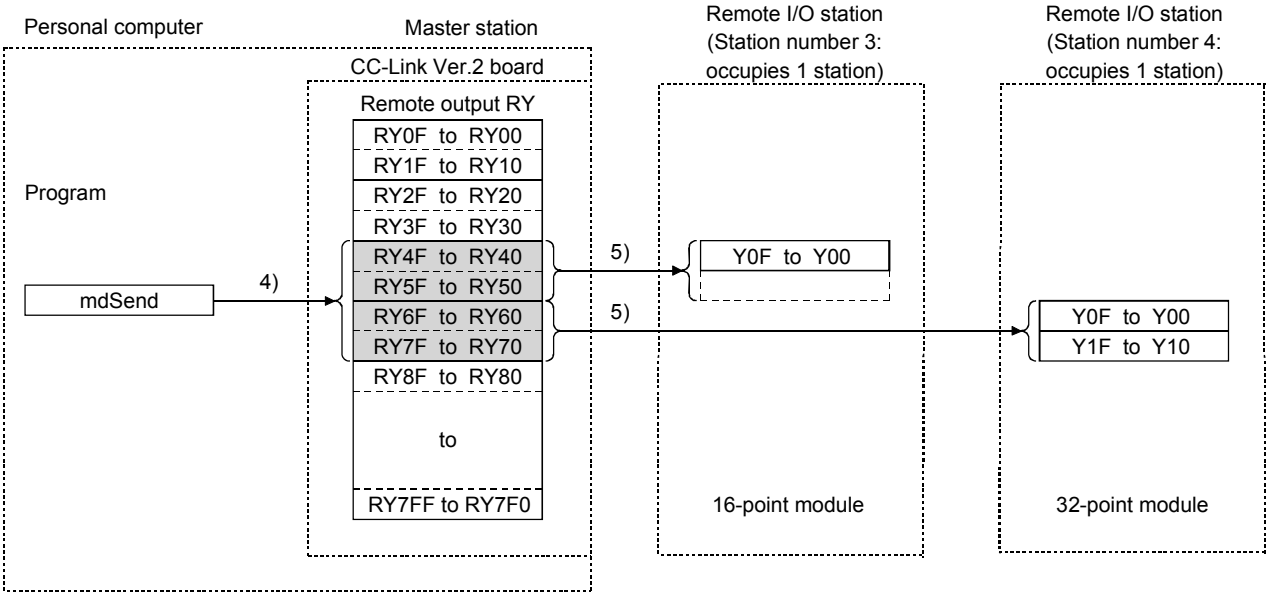
3) The program uses the mdReceive function to read the input status stored in the "remote input RX" buffer memory.



[Remote output]

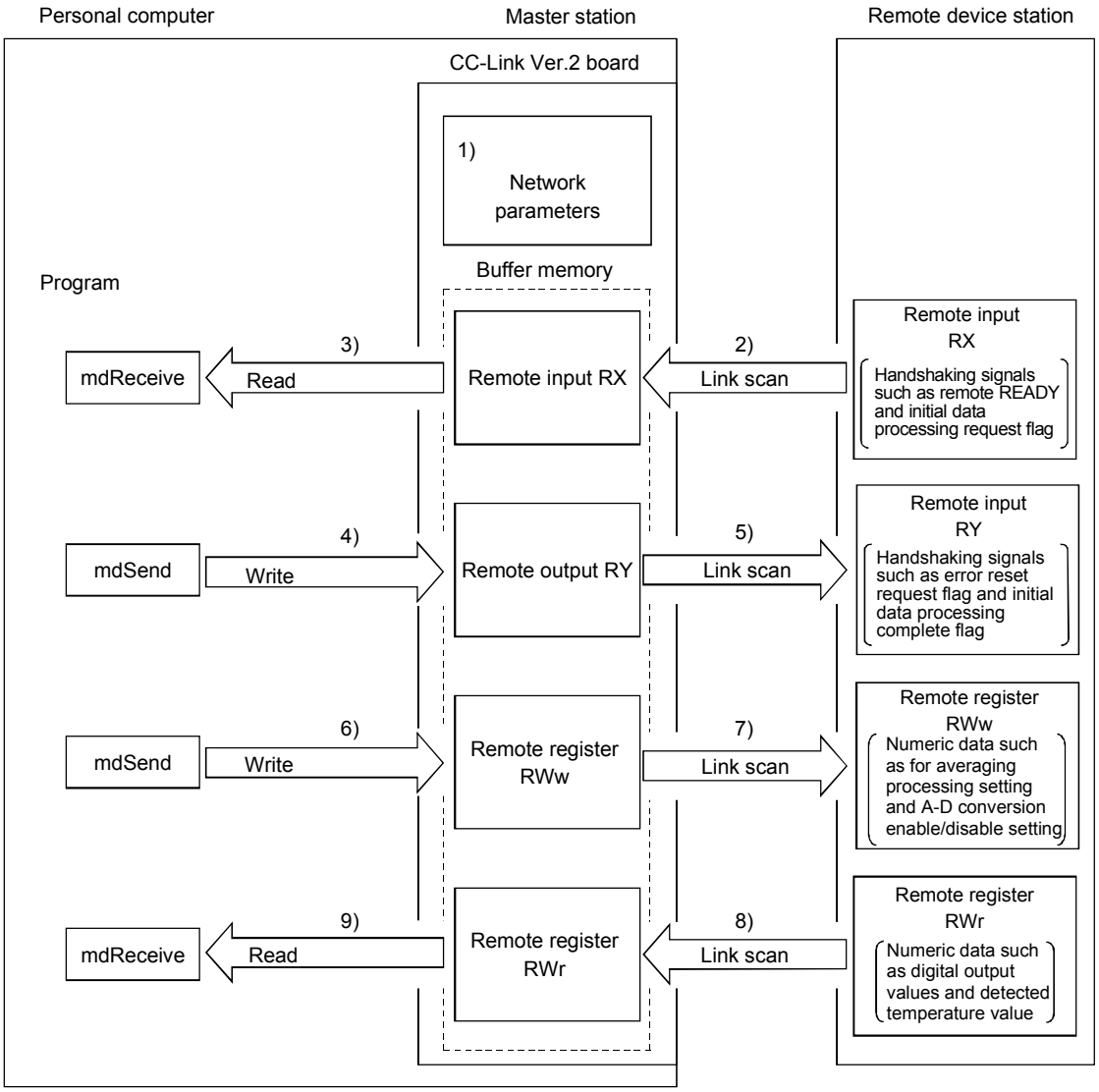
4) The program uses the mdSend function to write the on/off information to the "remote output RY" buffer memory.

5) The output status stored in the "remote output RY" buffer memory is output automatically (for each link scan) to the remote I/O stations.



4.2.2 Communication with the remote device stations

This section explains an overview of the communication between the master station and the remote device station.
In the communication with the remote device station, the handshaking signals with the remote device station (initial data processing request flag, error reset request flag, etc.) are communicated using the remote input RX and remote output RY. Numeric data (averaging processing specification, digital output values, etc.) is communicated using the remote register RWw and remote register RWr.



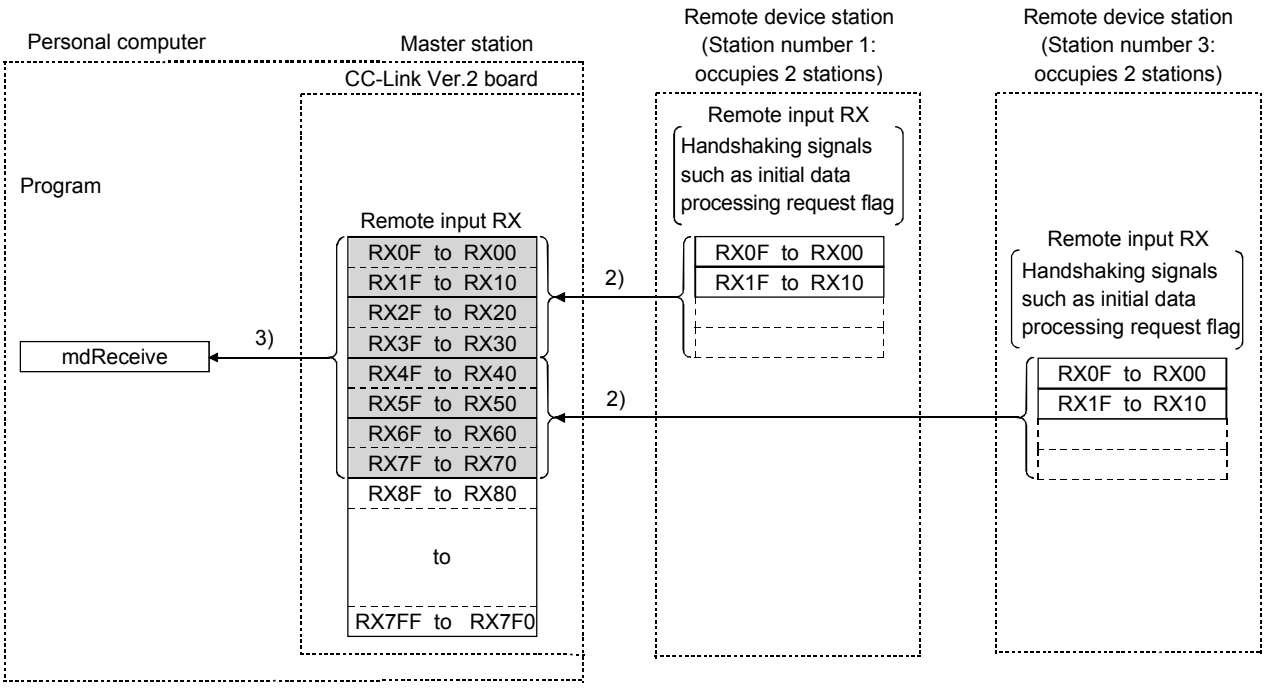
[Data link startup]

1) When the personal computer is powered on, the CC-Link system starts up in accordance with the network parameters set by the CC-Link Ver.2 utility.

[Remote input]

2) The remote input RX of each of the remote device stations is automatically stored (for each link scan) in the master station's "remote input RX" buffer memory.

3) The program uses the mdReceive function to read the input status stored in the "remote input RX" buffer memory.



[Remote input RX when the AJ65BT-64DAV is set to station number 1]

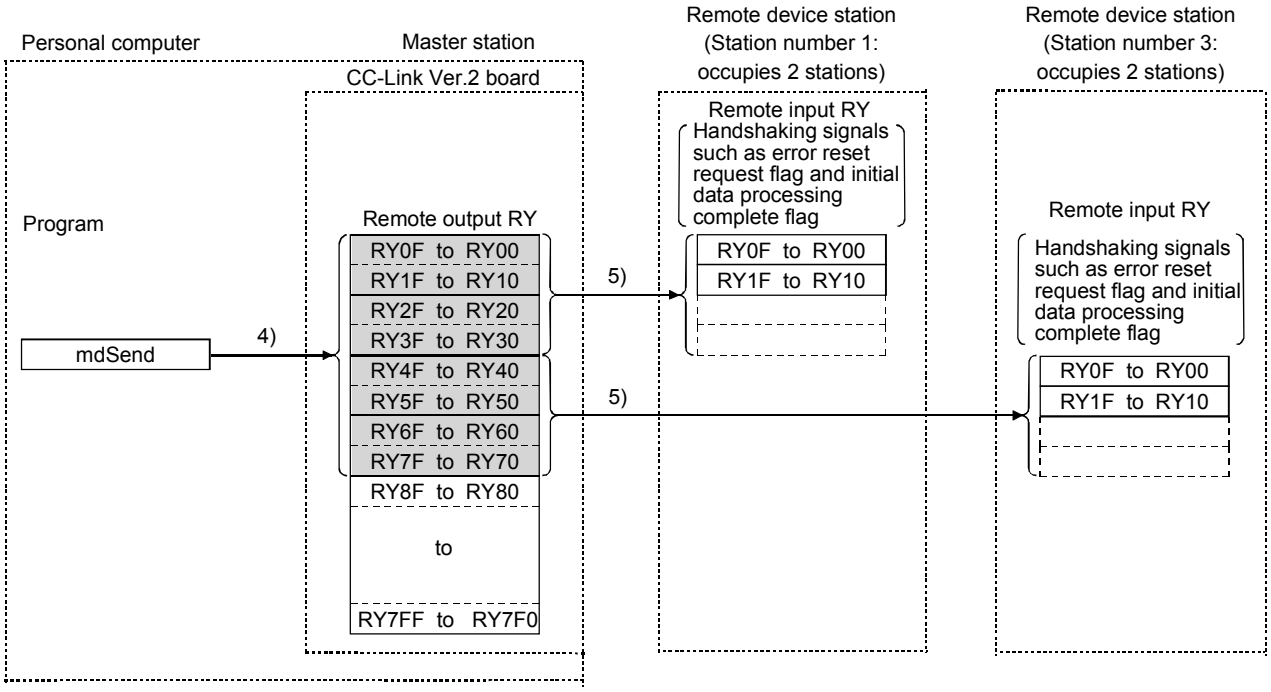
Signal direction: AJ65BT-64DAV → Master module	
Device No.	Signal name
RX00 to RX17	Not used
RX18	Initial data processing request flag
RX19	Initial data setting complete flag
RX1A	Error status flag
RX1B	Remote READY
RX1C to RX1F	Not used

4 - 6

[Remote output]

4) The program uses the mdSend function to write the on/off information to the "remote output RX" buffer memory.

5) The remote output RY is automatically set to on/off (for each link scan) according to the output status stored in the "remote output RY" buffer memory.



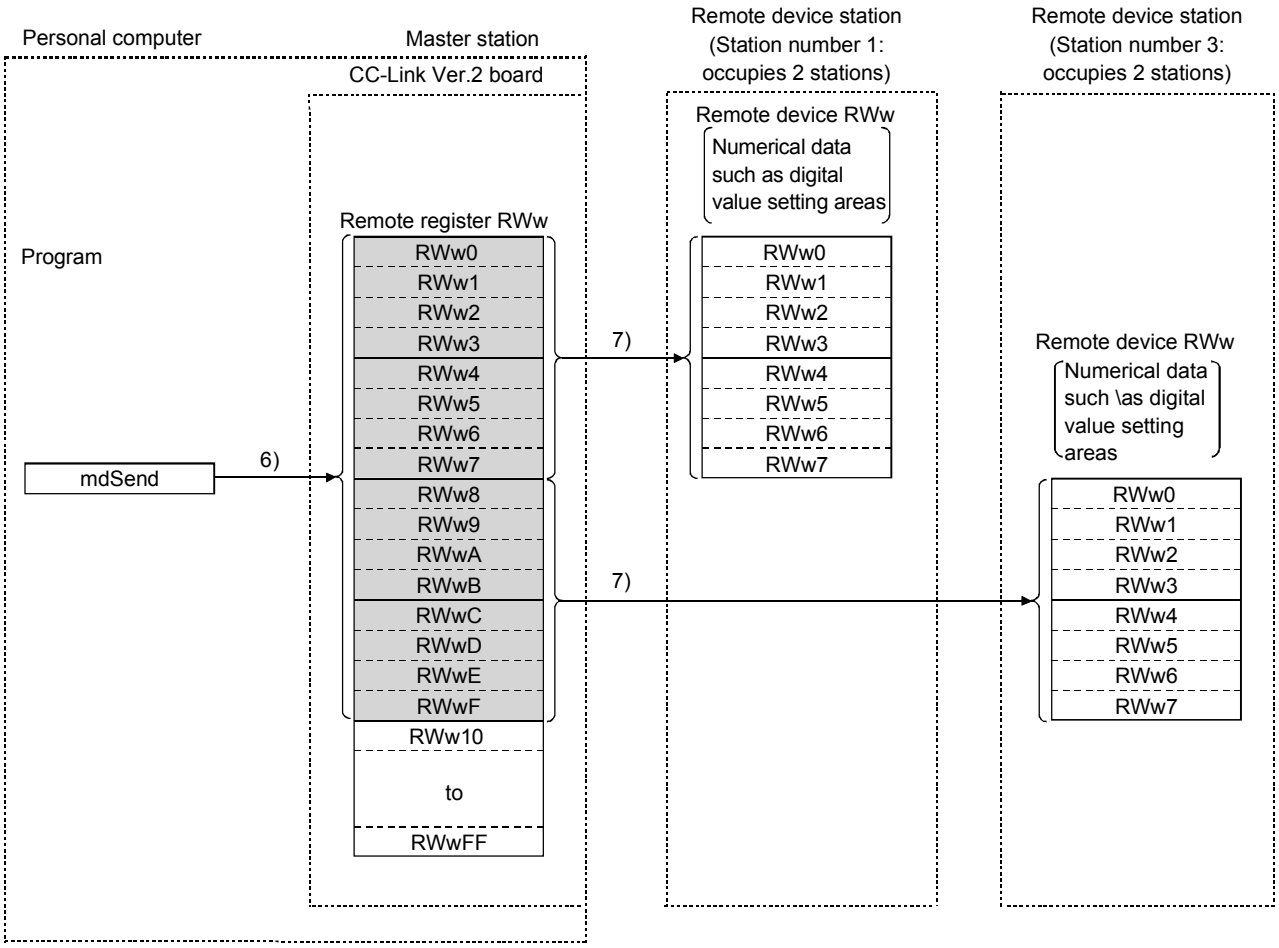
[Remote output RY when the AJ65BT-64DAV is set to station number 1]

Signal direction: Master module → AJ65BT-64DAV	
Device No.	Signal name
RY00	CH1 analog output enable signal
RY01	CH2 analog output enable signal
RY02	CH3 analog output enable signal
RY03	CH4 analog output enable signal
RY04	Selection of offset/gain values
RY05 to RY17	Not used
RY18	Initial data processing complete flag
RY19	Initial data setting request flag
RY1A	Error reset request flag
RY1B to RY1F	Not used

[Writing to the remote register RWw]

6) The program uses the mdSend function to write the transmission data to the "remote register RWw" buffer memory.

7) The data stored in the "remote register RWw" buffer memory is automatically sent to the remote register RWw of each remote device station.



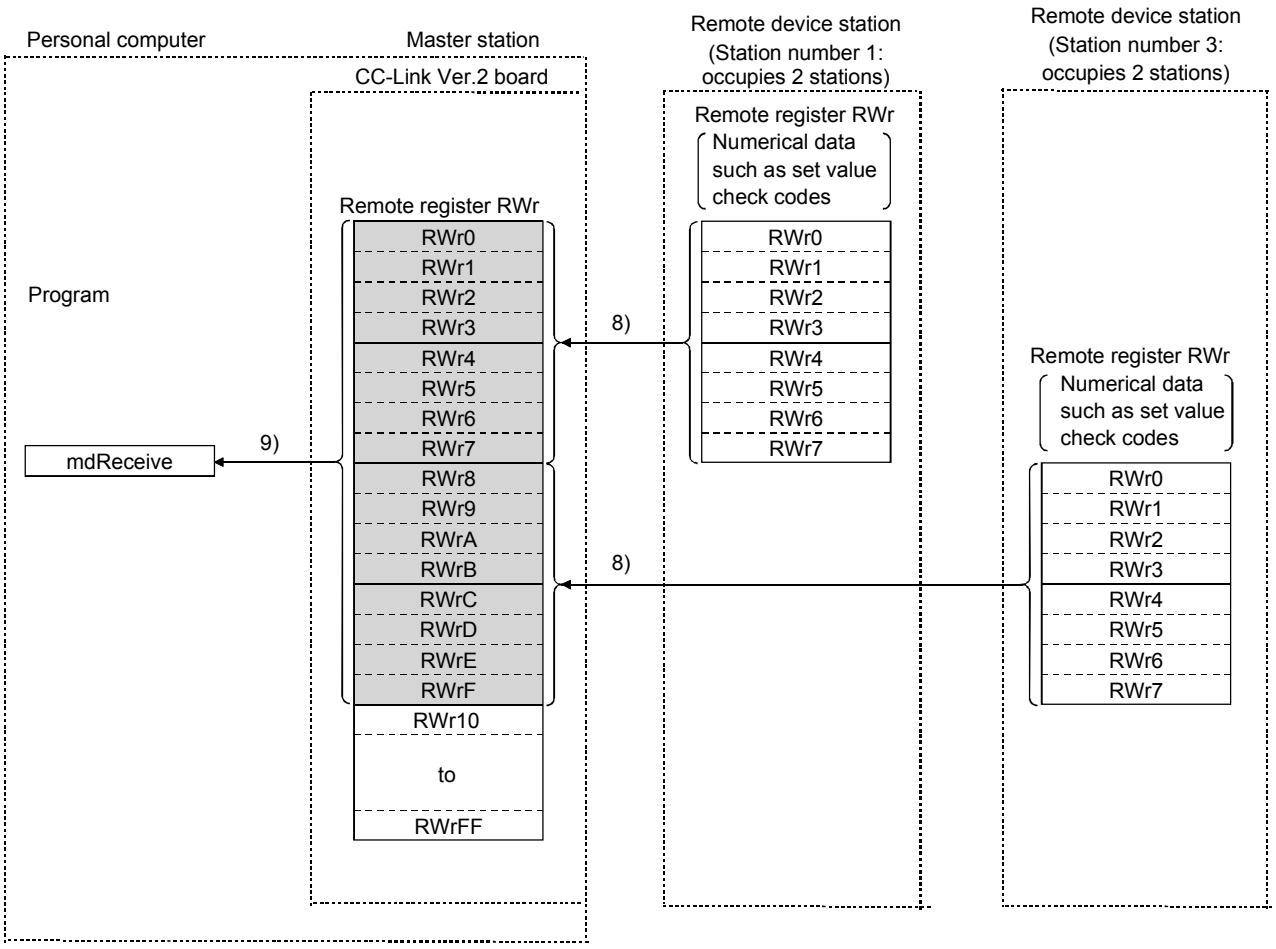
[Remote register RWw when the AJ65BT-64DAV is set to station number 1]

Signal direction: master module → AJ65BT-64	
Address	Description
RWw0	CH1 digital value setting area
RWw1	CH2 digital value setting area
RWw2	CH3 digital value setting area
RWw3	CH4 digital value setting area
RWw4	Analogue output enable/disable setting area
RWw5 to RWw7	Not used

[Reading from the remote register (RWr)]

8) The remote register RWr data of each of the remote device stations is automatically stored in the "remote register Rwr" buffer memory of the master station.

9) The program uses the mdReceive function to read the remote register RWr data of the remote device stations stored in the "remote register RWr" buffer memory.



[Remote register RWr when the AJ65BT-64DAV is set to station number 1]

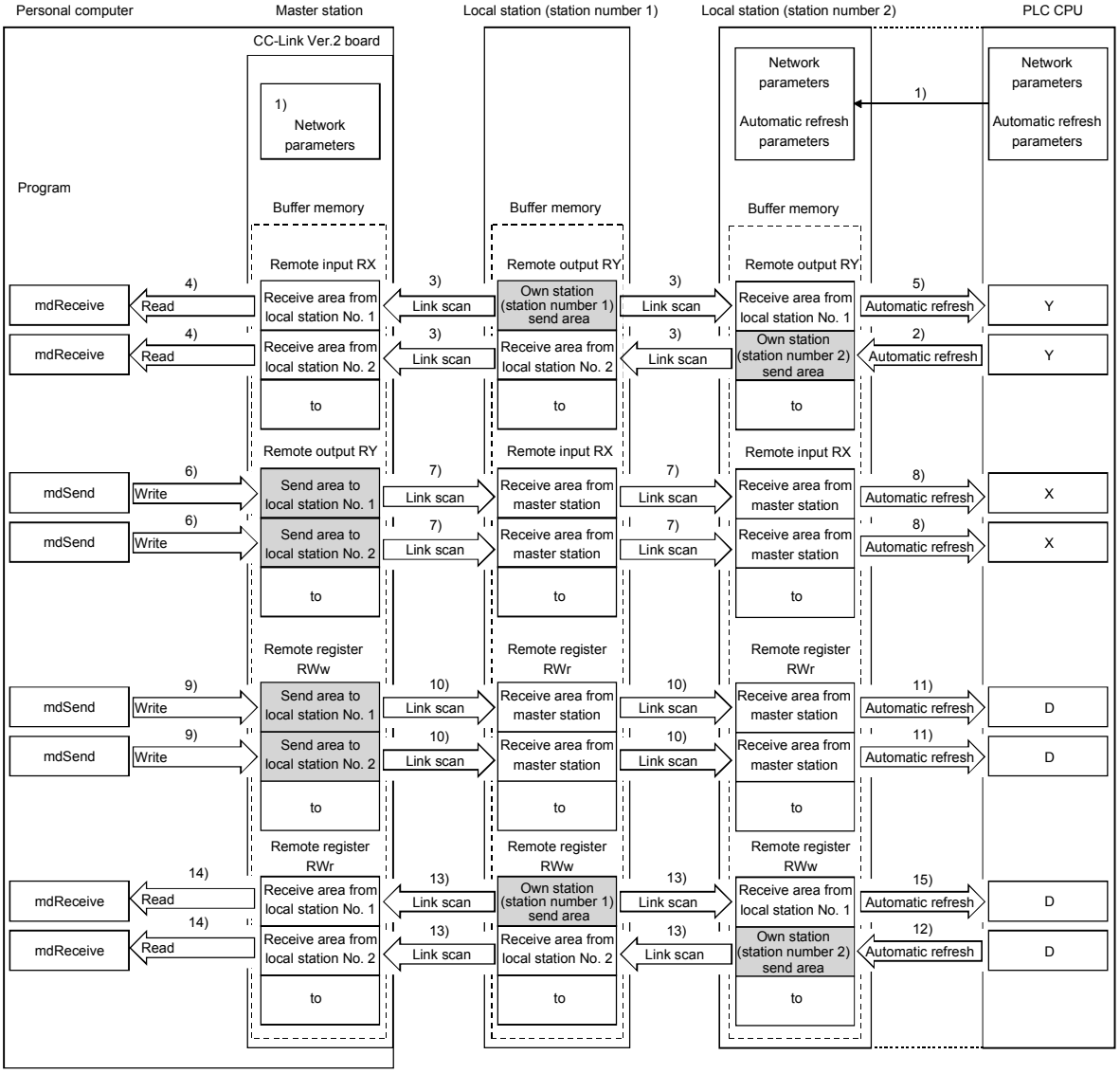
Signal direction: AJ65BT-64DAV → Master module	
Address	Description
RWr0	CH1 set value check code
RWr1	CH2 set value check code
RWr2	CH3 set value check code
RWr3	CH4 set value check code
RWr4	Error code
RWr5	Not used
RWr6	
RWr7	

4.2.3 Communication with the local stations

The following explains an overview of the communication between the master station and the local stations.

(1) Communication between the master station and the local stations by cyclic transmission

The data communication between programmable controller CPUs and personal computers can be performed in n:n mode using the remote input RX and remote output RY (bit information used in local station systems) as well as the remote register RWw and remote register RWr (word information for writing and reading used in local station systems).



POINT
The master station only sends data to stations where datalink has been started. The master station does not send any data to stations where datalink has not been started.

[Data link startup]

1) When the personal computer is powered on, the CC-Link system automatically starts up in accordance with the network parameters set by the CC-Link Ver.2 utility.

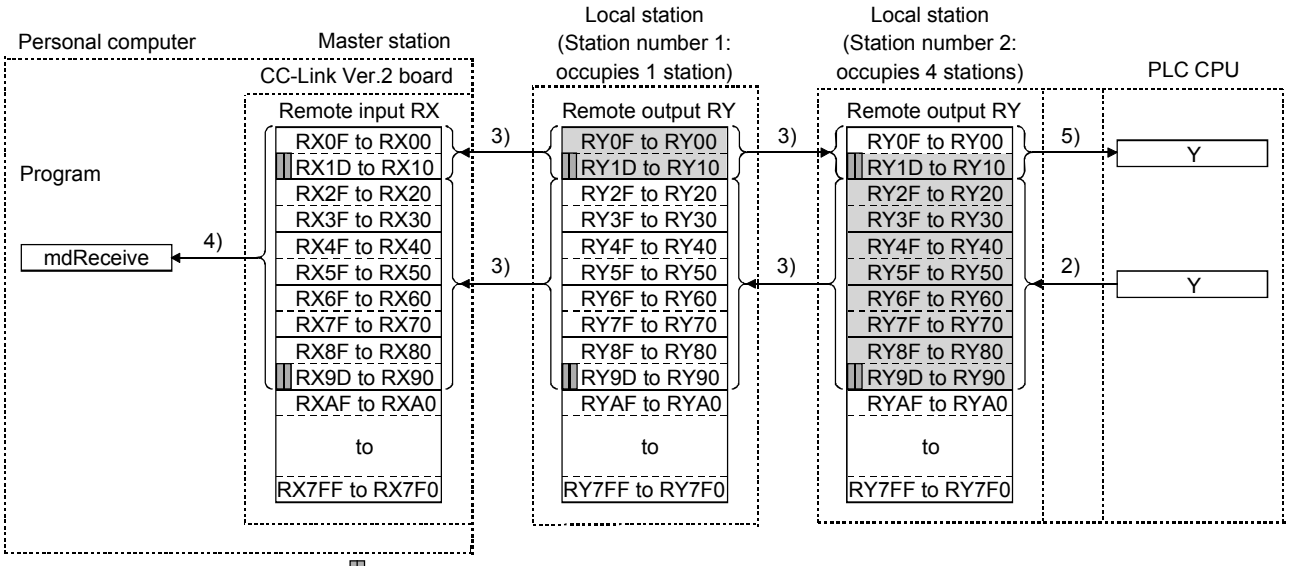
[On/off information from a local station to the master station or another local station]

2) The on/off information of the CPU device set with automatic refresh parameters is stored in the "remote output RY" buffer memory of a local station. The remote output RY is used as the output information to be used by the local station system.

3) The information in the "remote output RY" buffer memory of the local station is automatically stored (for each link scan) in the "remote input RX" buffer memory of the master station and the "remote output RY" buffer memory of another local station.

4) The program uses the mdReceive function to read the input status stored in the "remote input RX" buffer memory.
The remote input RX is used as the input information to be used by the local station systems.

5) The input status stored in the "remote output RY" buffer memory is stored in the CPU device set with automatic refresh parameters.



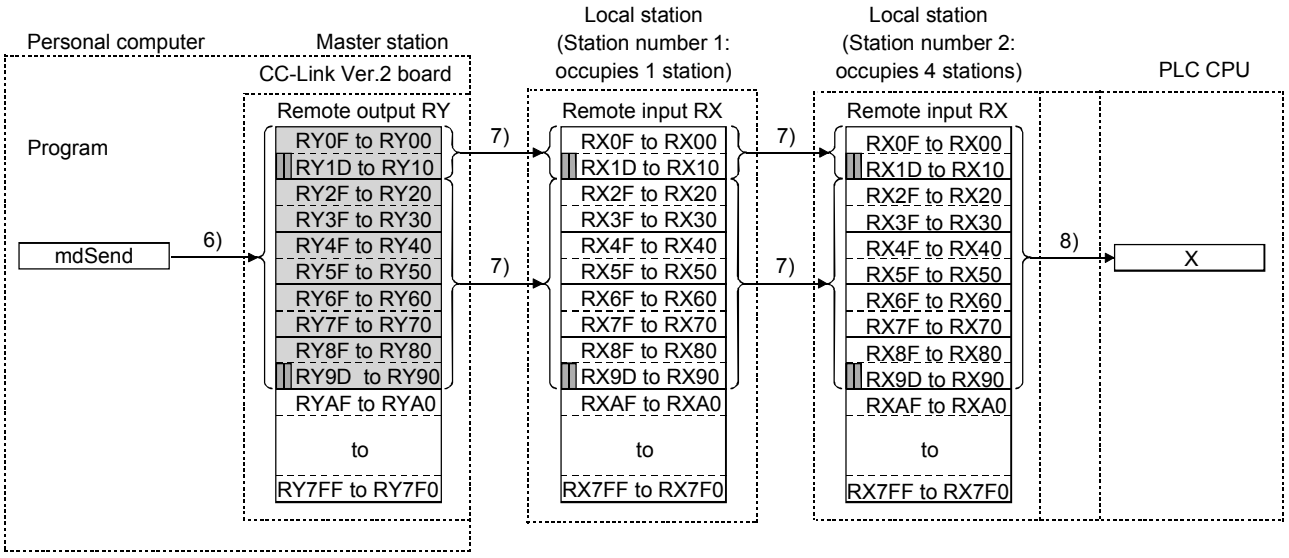
••••••The last two bits cannot be used in the communication between the master station and the local stations.

[On/off information from the master station to the local stations]

6) The program uses the mdSend function to write the on/off information to the "remote output RY" buffer memory of the master station.

7) The information in the "remote output RY" buffer memory is automatically stored (for each link scan) in the "remote input RX" buffer memory of each of the local stations.

8) The input status stored in the buffer memory "remote input RX" is stored in the CPU device set with automatic refresh parameters.



▯ ••••••• The last two bits cannot be used in the communication between the master station and the local stations.

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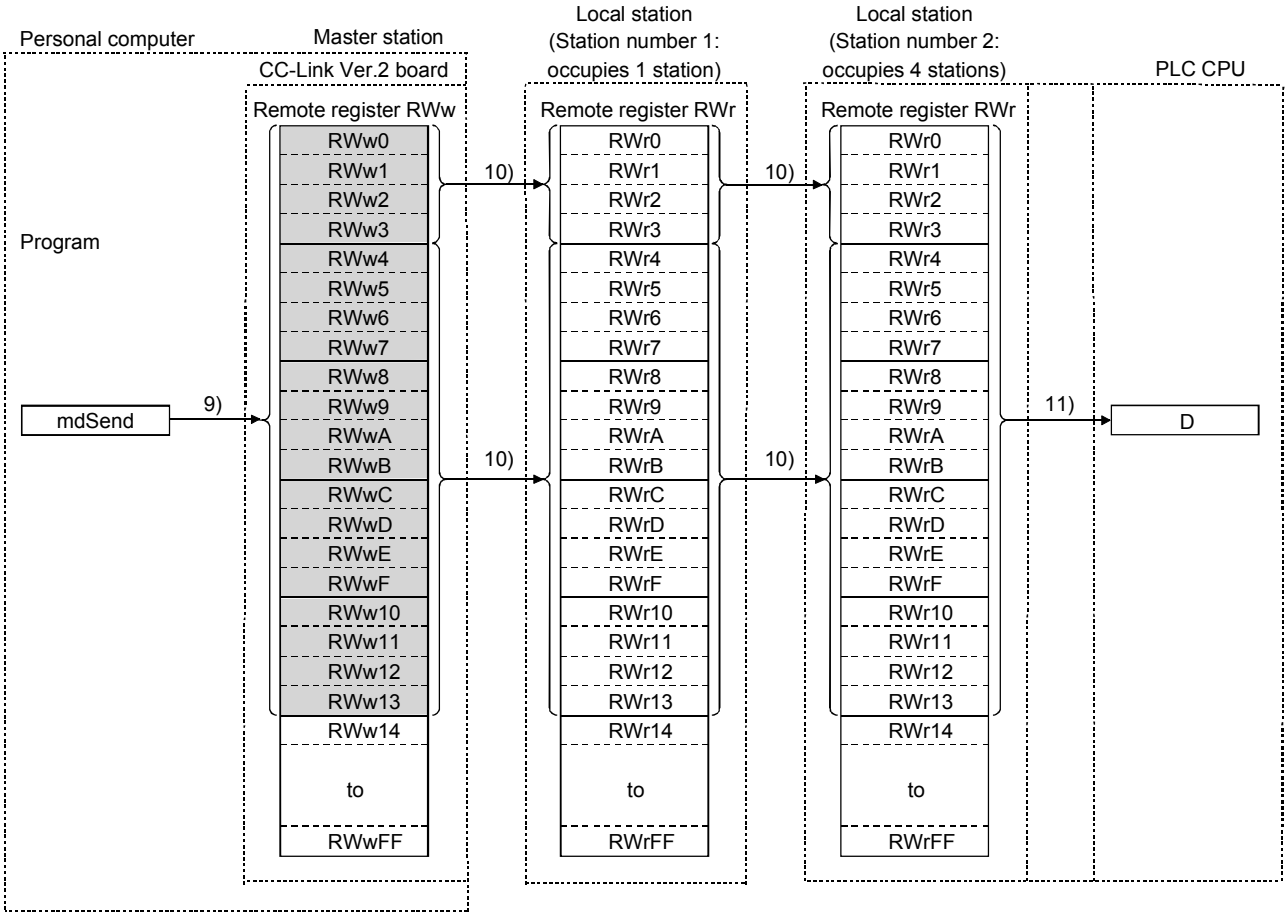
[Word information from the master station to all local stations]

9) The program uses the mdSend function to write the word information to the "remote register RWw" buffer memory of the master station.
The remote register RWw is used as the word information for writing to be used by local station systems.

10) The information in the "remote register RWw" buffer memory is automatically stored (for each link scan) in the "remote registers RWr" of all local stations.
The remote register RWr is used as the word information for reading to be used by local station systems.

11) The word information stored in the "remote register RWr" buffer memory is stored in the CPU device set with automatic refresh parameters.



4 - 13

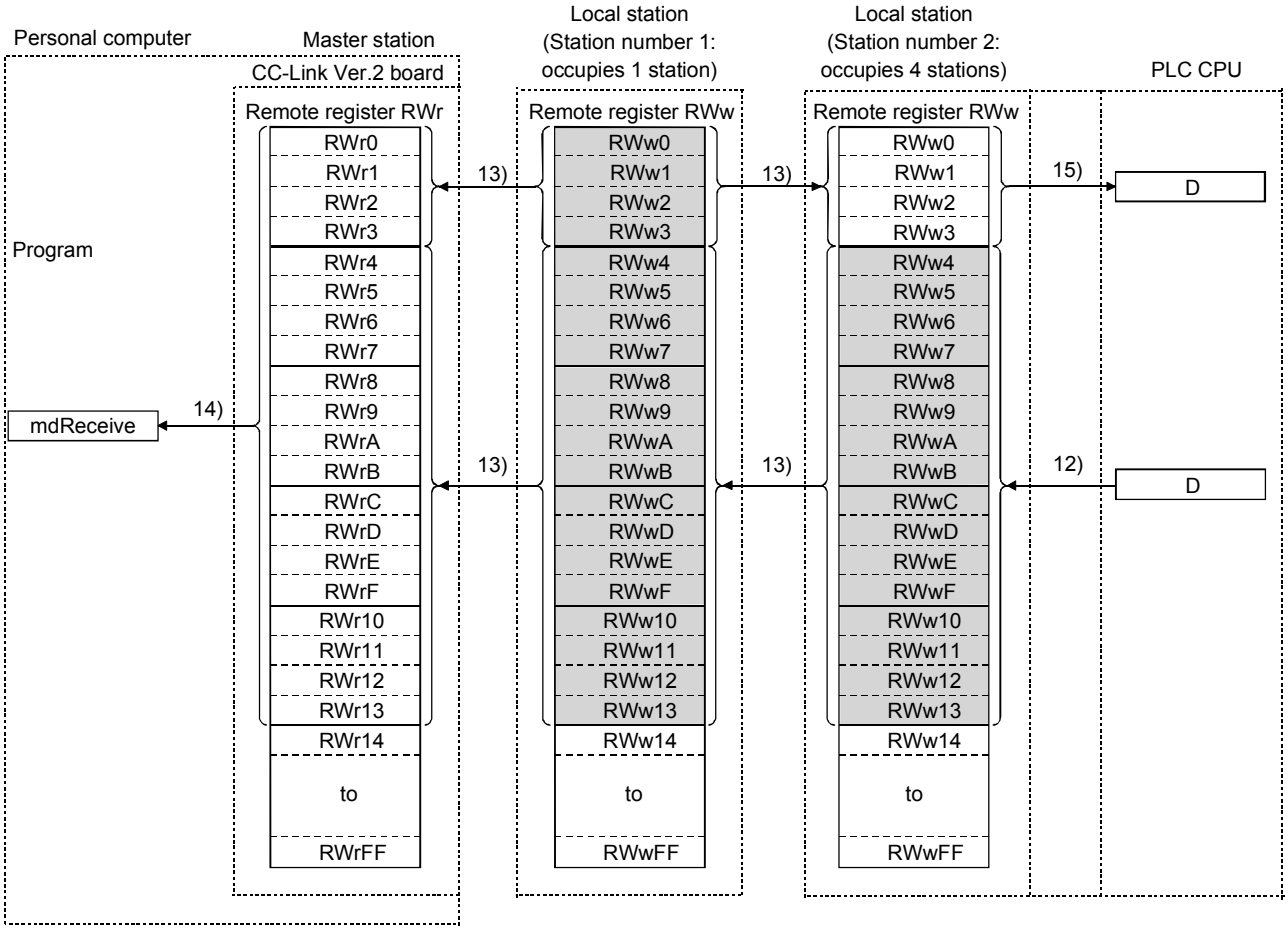
[Word information from a local station to the master station and another local station]

12) The word information set with automatic refresh parameters is stored in the "remote register RWw" buffer memory of a local station. However, it can only be stored in the area corresponding to the station number of the own station.

13) The information in the "remote register RWw" buffer memory is automatically stored (for each link scan) in the "remote register RWr" of the master station and the "remote register RWw" of another local station.

14) The program uses the mdReceive function to read the word information stored in the "remote register RWw" buffer memory.

15) The word information stored in the "remote register RWw" buffer memory is stored in the CPU device set with automatic refresh parameters.



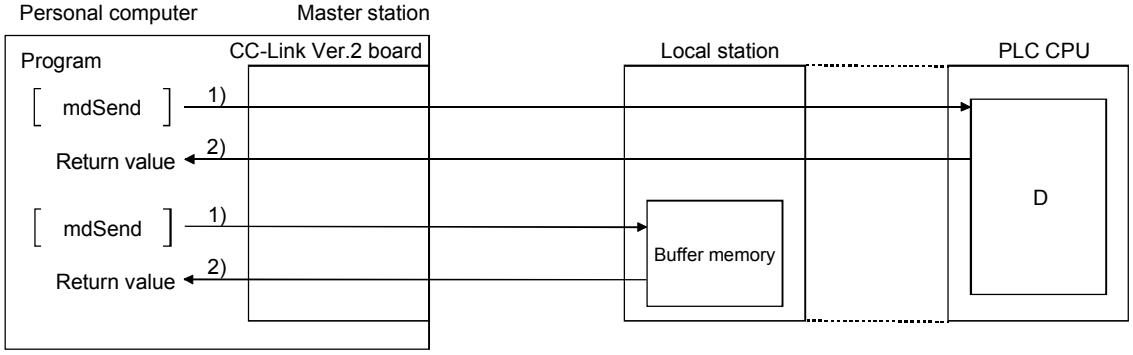
4 - 14

(2) Communication between the master station and the local station by transient transmission

The transient transmission is a transmission method that sends and receives data in 1 : 1 mode by designating the opposite station at an arbitrary timing.

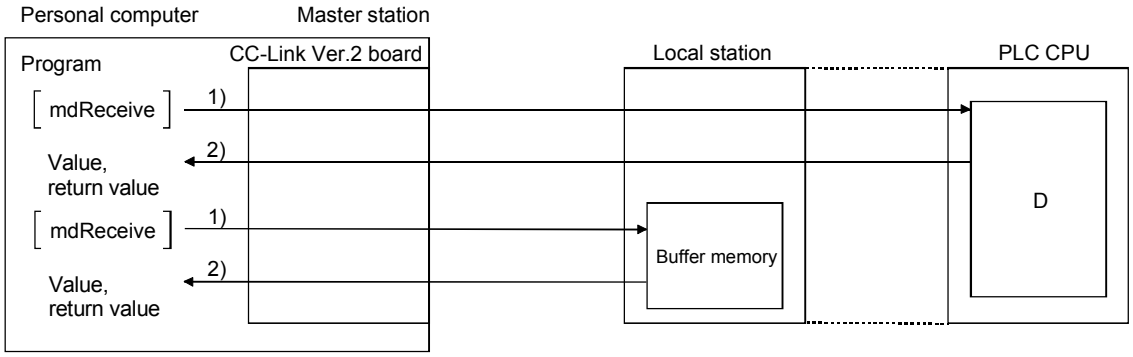
[When writing data to the buffer memory of the local station and the CPU device using the mdSend function]

1) The program uses the mdSend function to write data from the master station to the designated buffer memory of the local station and a CPU device.
2) When writing is completed, 0 is stored as return values.



[When reading data from the buffer memory and CPU device in a local station using the mdReceive function]

1) The program uses the mdReceive function to read data from the designated buffer memory of the local station and the CPU device to the variables of the program in the master station.
2) When reading is completed, 0 is stored as return values.



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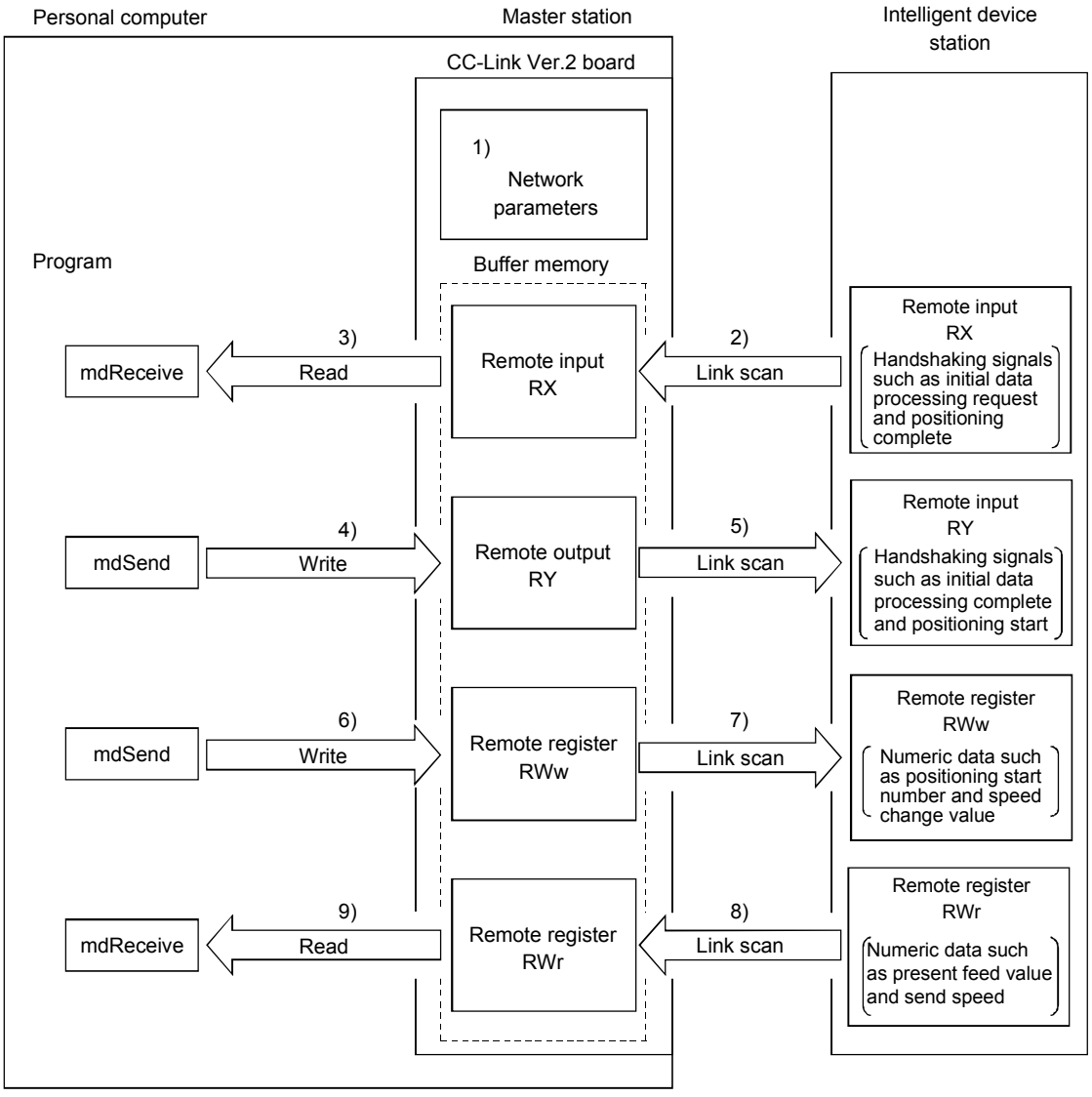
4.2.4 Communication with the intelligent device station

The following explains an overview of the communication between the master station and the intelligent device station.

(1) Communication between the master station and the intelligent device station by cyclic transmission

Handshaking signals with the intelligent device station (positioning complete, positioning start. etc.) are communicated using the remote input RX and remote output RY. Numeric data (positioning start number, present feed value, etc.) is communicated using the remote register RWw and remote register RWr.



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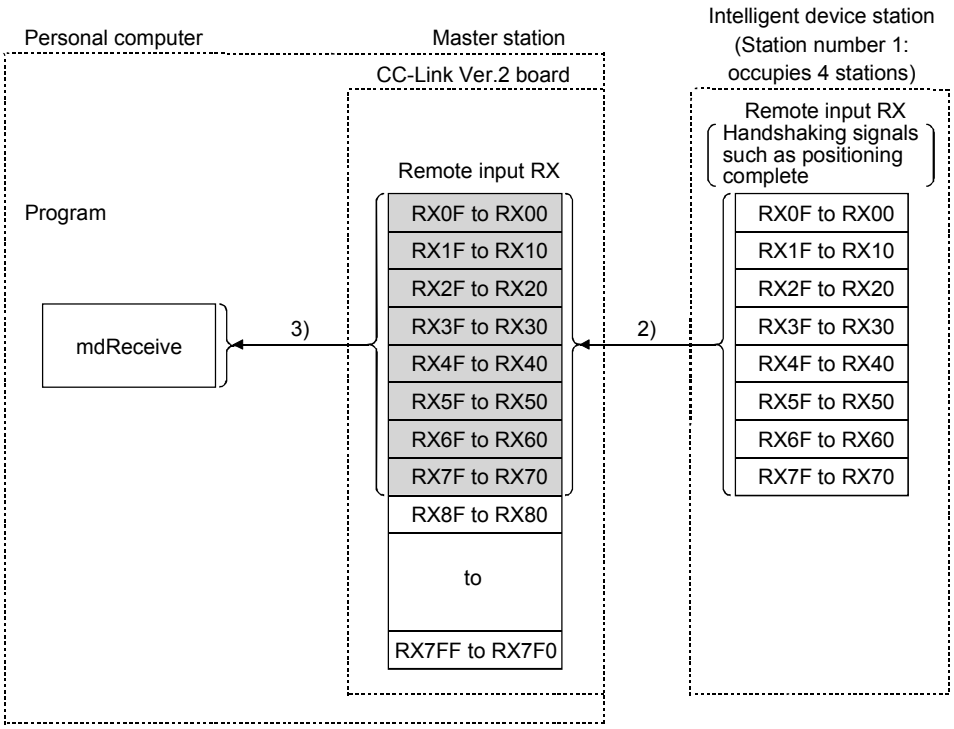
[Data link startup]

1) When the personal computer is powered on, the CC-Link system automatically starts up in accordance with the network parameters set by the CC-Link Ver.2 utility.

[Remote input]

2) The remote input RX of the intelligent device station is automatically stored (for each link scan) in the "remote input RX" buffer memory of the master station.

3) The program uses the mdReceive function to read the input status stored in the "remote input RX" buffer memory.



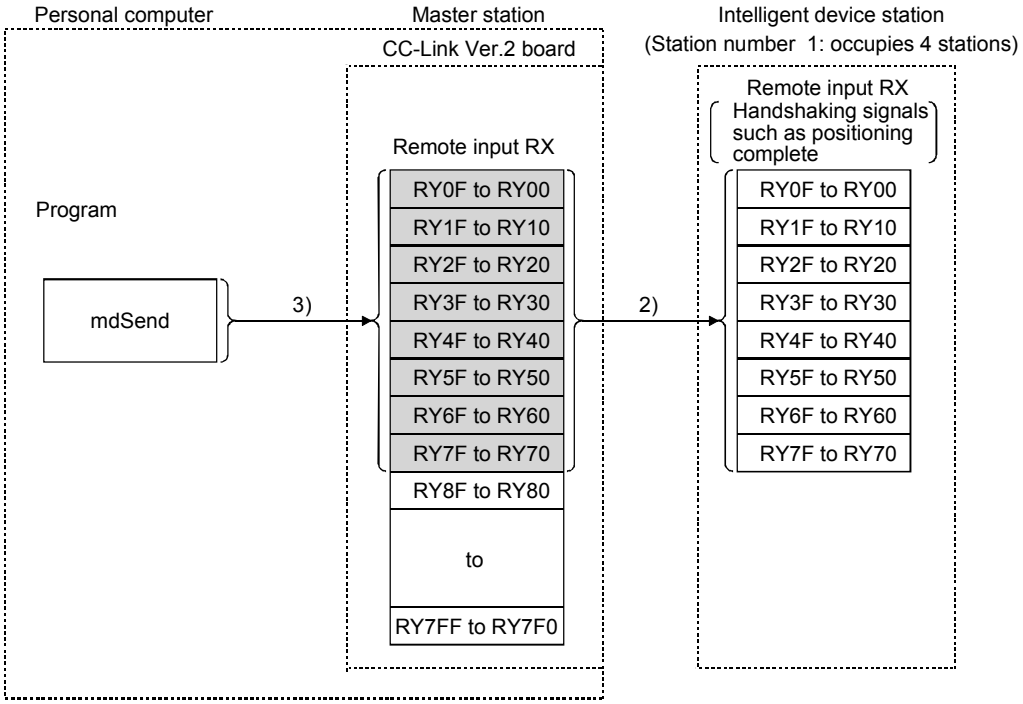
[Remote input RX when the AJ65BT-D75P2-S3 is set to station number 1]

Signal direction: AJ65BT-D75P2-S3 → Master module	
Device No.	Signal name
RX00	D75P2 ready complete
RX01	Single-axis start complete
RX02	Dual-axes start complete
RX03	Use prohibited
RX04	Single-axis BUSY
RX05	Dual-axis BUSY
RX06	Use prohibited
RX07	Single-axis positioning complete
RX08	Dual-axis positioning complete
to	to

[Remote output]

4) The program uses the mdSend function to write the on/off information to the "remote output RY" buffer memory.

5) The remote output RY of the intelligent device station is automatically set to on/off (for each link scan) according to the output status stored in the "remote output RY" buffer memory.



[Remote output RY when the AJ65BT-D75P2-S3 is set to station number 1]

Signal direction: AJ65BT-D75P2-S3 → Master module	
Device No.	Signal name
RY01 to RY0F	Use prohibited
RY10	Single-axis positioning start
RY11	Dual-axis positioning start
RY12	Use prohibited
RY13	Single-axis stop
RY14	Dual-axis stop
to	to

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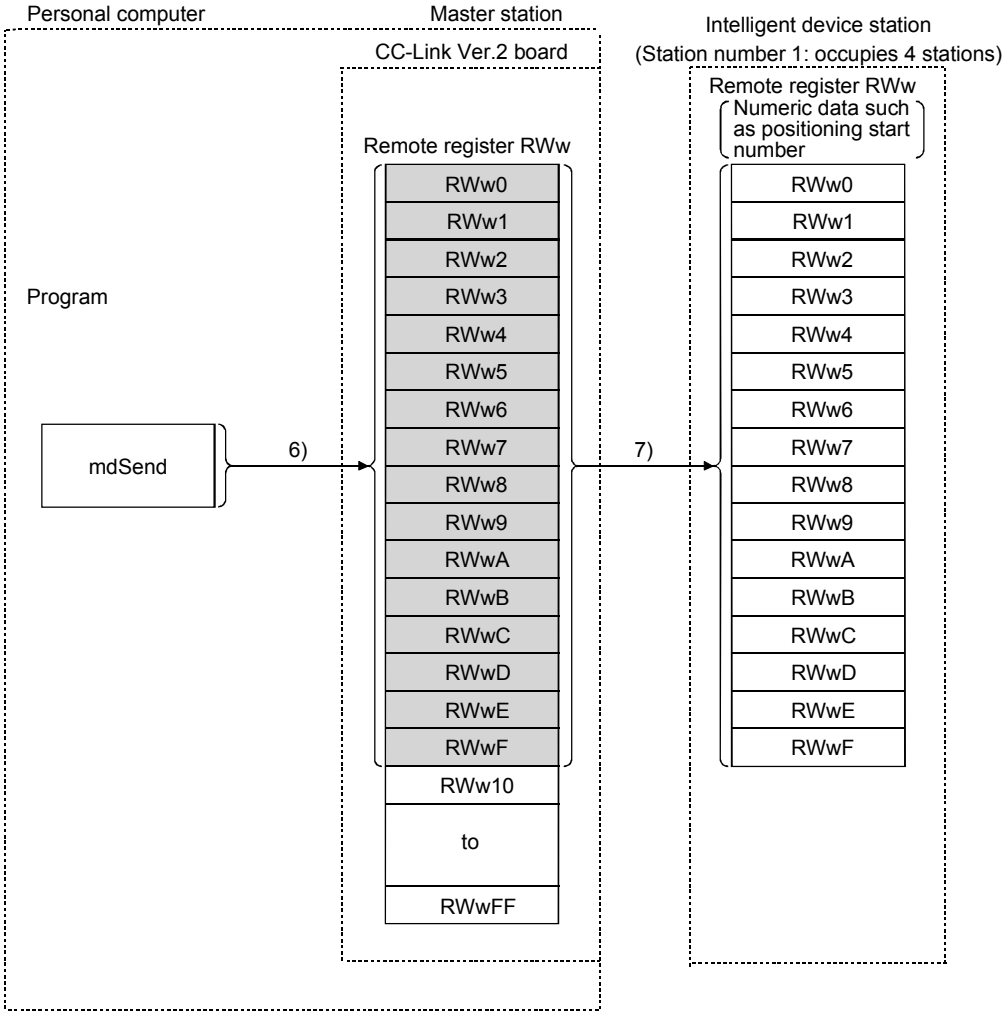
[Writing to the remote register RWw]

6) The program uses the mdSend function to write the sending data to the "remote register RWw" buffer memory.

7) The data stored in the "remote register RWw" buffer memory is automatically sent to the remote register RWw of the intelligent device station.



[Remote register RWw when the AJ65BT-D75P2-S3 is set to station number 1]

Signal direction: Master module → AJ65BT-D75P2-S3	
Address	Description
RWw0	Single-axis positioning start number
RWw1	Single-axis override
RWw2	Single-axis new present value
RWw3	
RWw4	Single-axis new speed value
RWw5	
RWw6	Single-axis JOG speed
RWw7	
to	to

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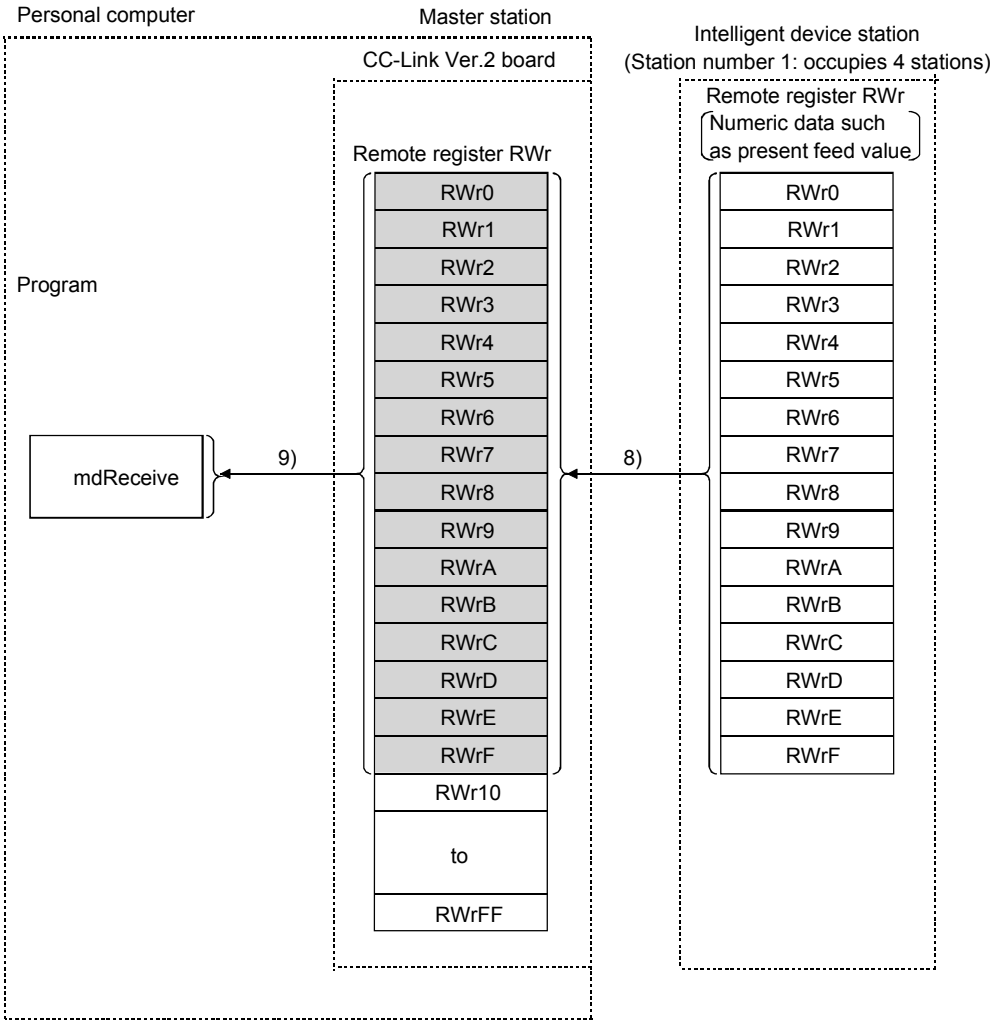
[Reading from the remote register RWr]

8) The remote register RWr data of the intelligent device station is automatically stored in the "remote register Rwr" buffer memory of the master station.

9) The program uses the mdReceive function to read the remote register RWr data of the intelligent device station stored in the "remote register RWr" buffer memory.



[Remote register RWw when the AJ65BT-D75P2-S3 is set to station number 1]

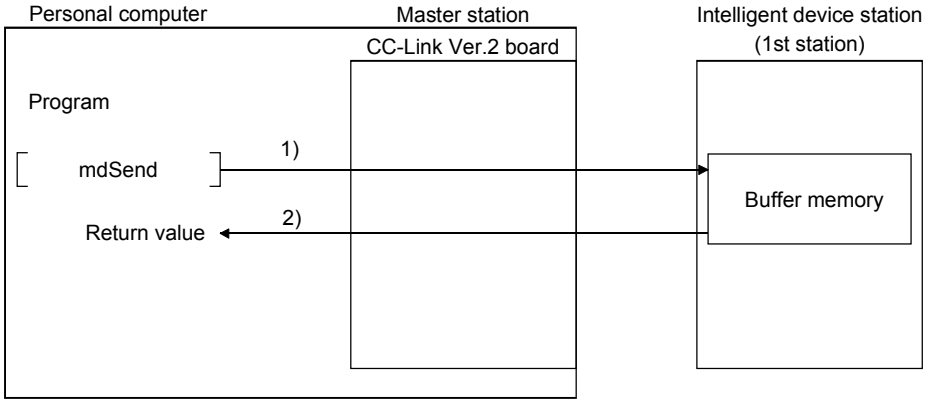
Signal direction: AJ65BT-D75P2-S3 → Master module	
Address	Description
RWr0	Single-axis present feed value
RWr1	
RWr2	Single-axis feed speed
RWr3	
RWr4	Single-axis valid M code
RWr5	Single-axis error number
RWr6	Single-axis warning number
RWr7	Single-axis operating status
to	to

(2) Communication between the master station and the intelligent device station by transient transmission

The transient transmission is a transmission method that sends and receives data in 1 : 1 mode by designating an opposite station at an arbitrary timing.

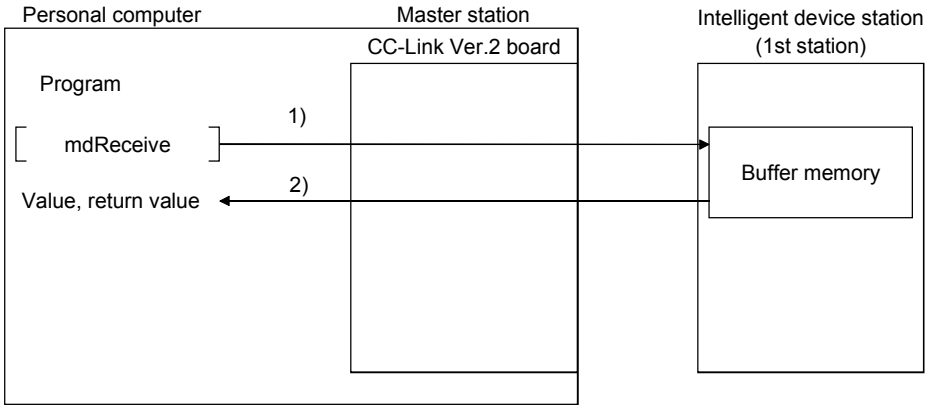
[When writing data to the buffer memory of the intelligent device station using the mdSend function]

1) The program uses the mdSend function to write data from the master station to the designated buffer memory of the intelligent device station.
2) When writing is completed, 0 is stored as a return value.



[When reading data from the buffer memory of the intelligent device station using the mdReceive function]

1) The program uses the mdReceive function to read data from the designated buffer memory of the intelligent device station to the variables of the program in the master station.
2) When reading is completed, 0 is stored as a return value.



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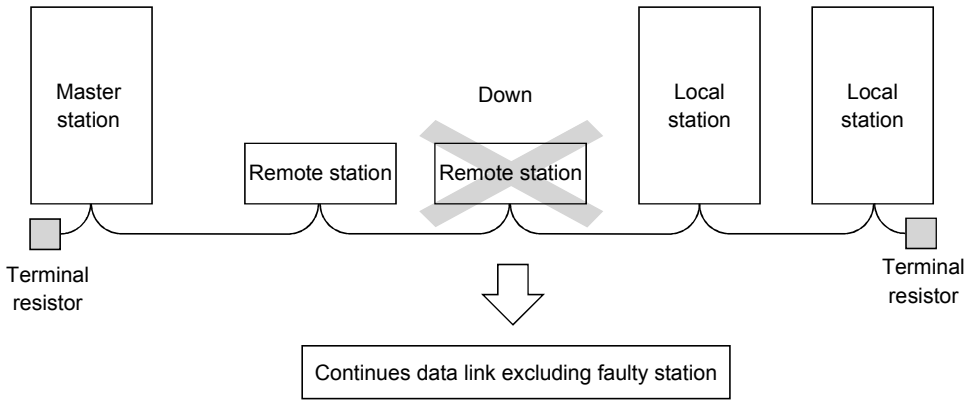
4.3 Functions for Improving System Reliability

This section explains how to use the functions for improving the reliability of the CC-Link system.

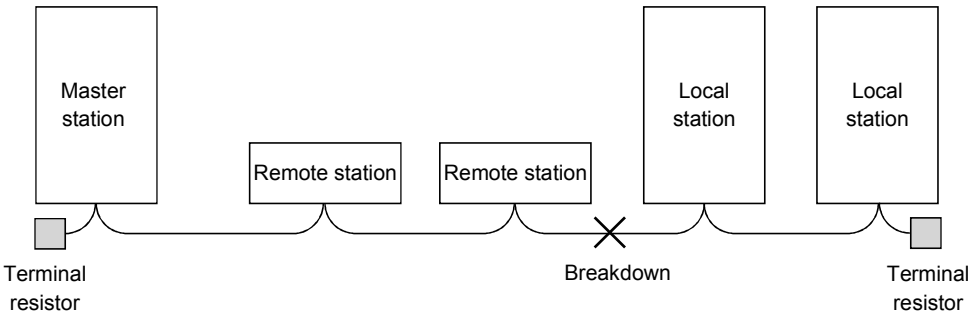
4.3.1 Disconnecting a data link faulty station and continuing the data link with only normal stations (slave station disconnect function)

This function disconnects any of the remote stations, local stations, intelligent device stations, and standby master station if it has become data link faulty due to power off or other cause, and continues the data link among normal remote stations, local stations, intelligent device stations, and standby master station (no setting is required).



POINT

In the event of a cable breakdown, the data link cannot be performed because there is no terminal resistor.



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4.3.2 Automatically reconnecting a disconnected data link faulty station when it returns to normal (auto return function)

This function allows any of the remote stations, local stations, intelligent device stations, and standby master station that has been disconnected from the data link due to power off or other cause to automatically reconnect to the data link when it returns to the normal status.

[Setting method]

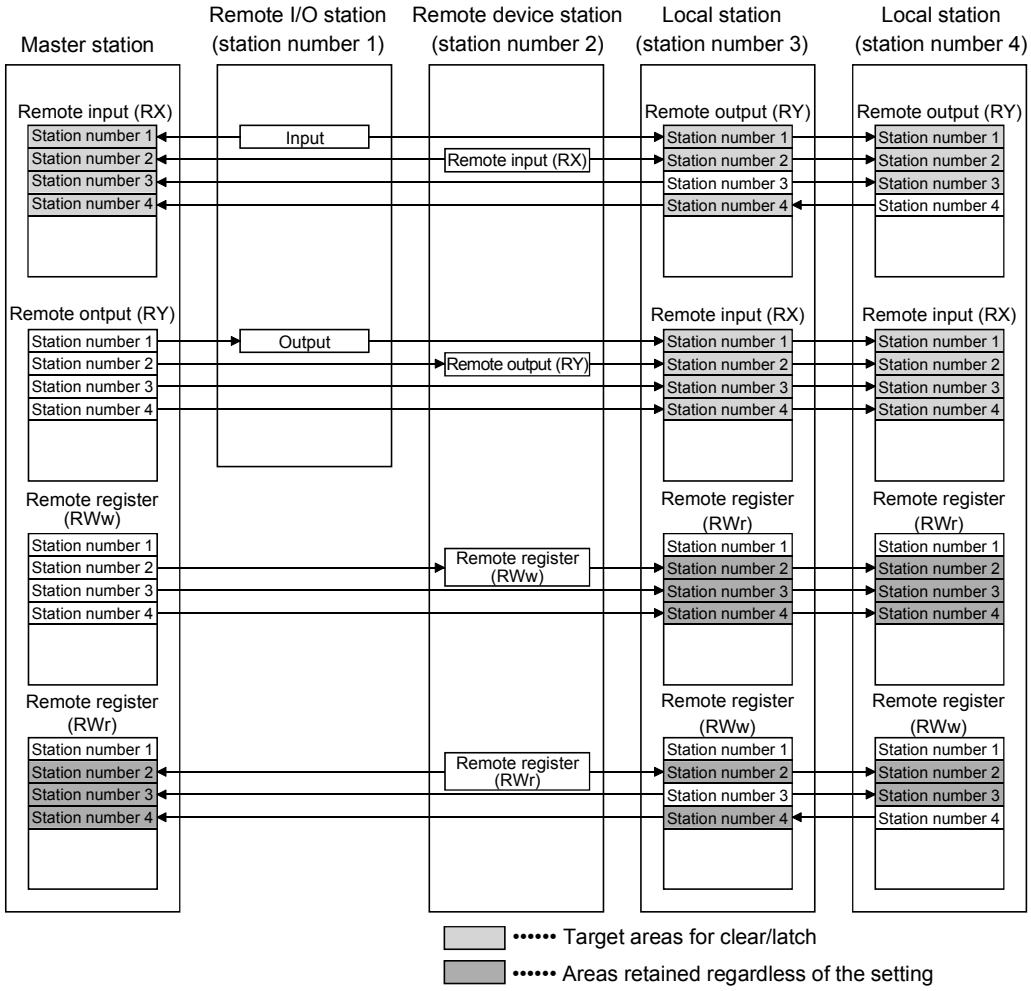
The setting is performed at <<Parameter settings>> in the CC-Link Ver.2 utility. For more details on the setting, refer to Section 8.2.5.

4.3.3 Retaining the device status of a data link faulty station (setting the input data status from a data link faulty station)

This function sets the input (reception) data status from a data link faulty station.

(1) Target input (reception) data

The following shows the target buffer memory areas.



The remote input RX in the master station, and the remote input RX and remote output RY in the local stations will either clear or retain the data from faulty stations according to the setting. The remote register RWr in the master station and the remote registers RWw and RWr in the local stations retain data from faulty stations regardless of the setting.

POINT

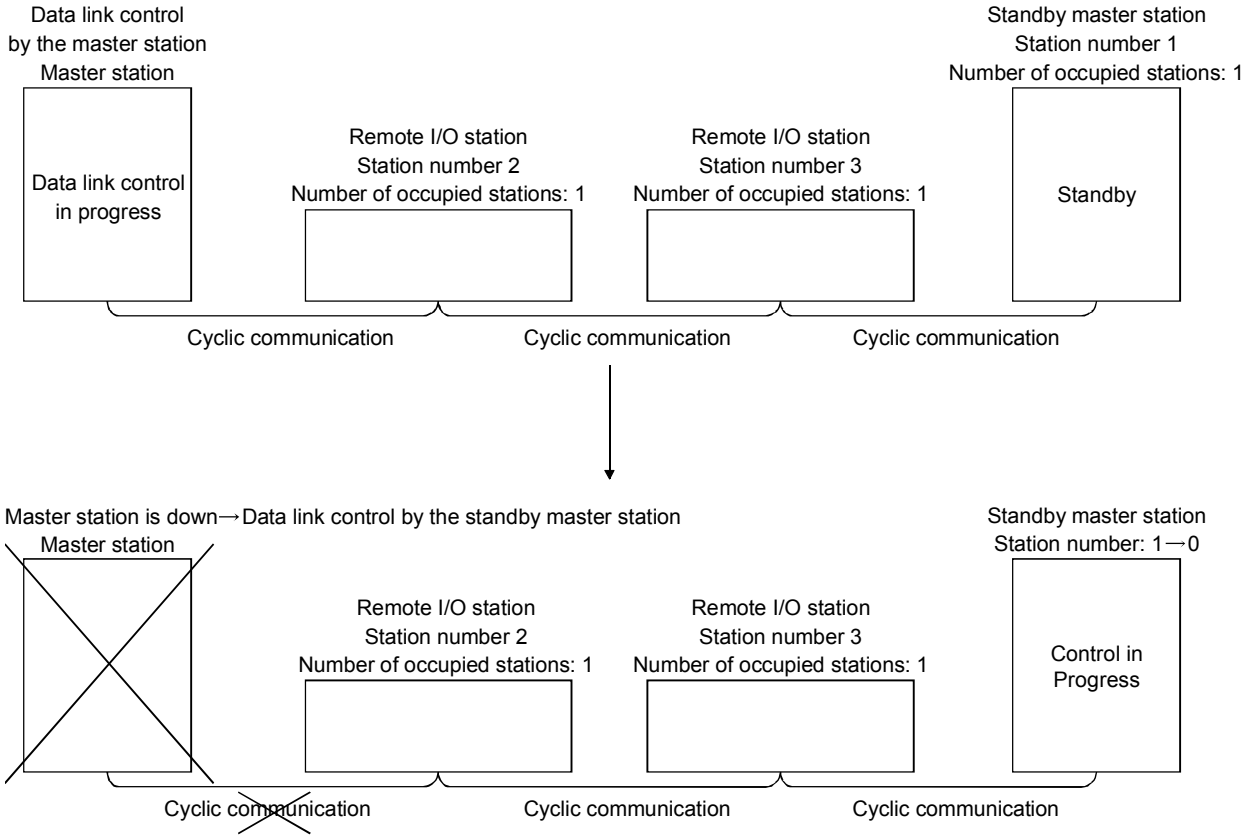
When a data link faulty station is set as an error invalid station, the input data (remote input RX and remote output RY) from that station is retained regardless of the setting.

(2) Setting method

The setting is performed at <<Parameter settings>> in the CC-Link Ver.2 utility. For more details on the setting, refer to Section 8.2.5.

4.3.4 Continuing the data link even when the master station is faulty (standby master function)

This function enables the data link to continue by switching a faulty master station to a standby master station (i.e. a backup station for the master station).
Note that, even if the master station has been restored, automatic switching from the standby master station to the master station is not performed.



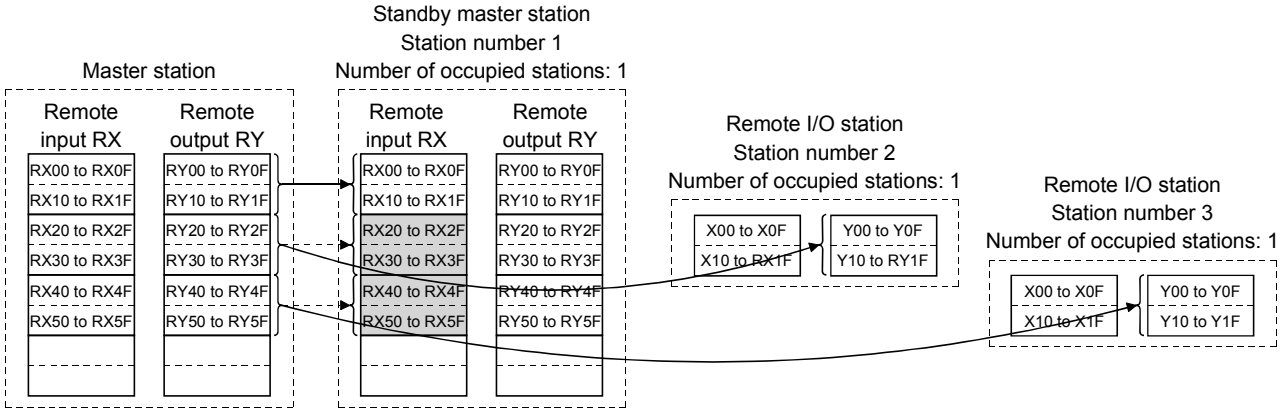
In this section, the above system configuration will be used in the explanation.

POINT
Refer to "Section 2.2 (1)" for the combinations when using the CC-Link Ver.2 board as the standby master station.

(1) Overview of link data transmission when the standby master function is used

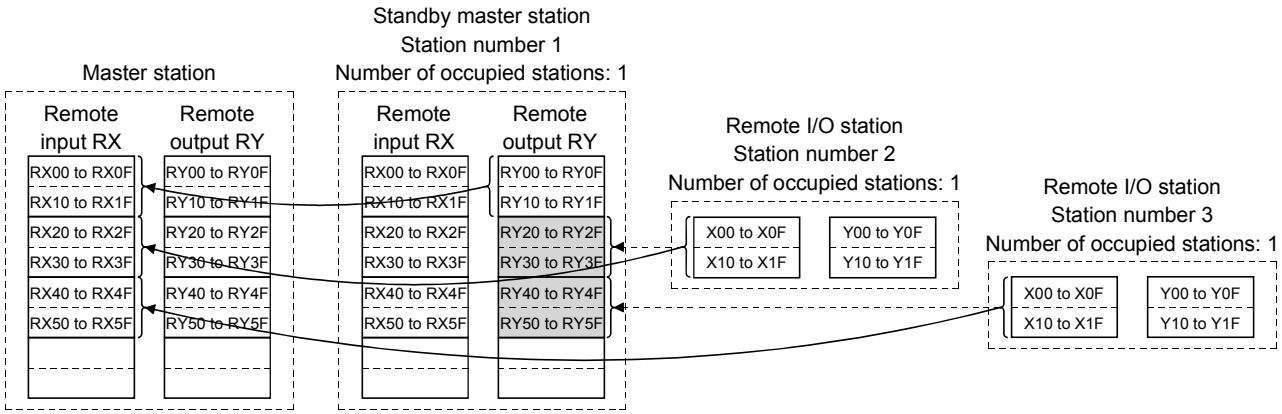
The following provides an overview of link data transmission when the standby master function is used.

(a) "Master station output" while the master station is controlling the data link



The master station data sent to the remote input RX in the standby master station (shown by the shaded areas in the figure above) is used as the output information when the master station becomes faulty; thus, it should be transferred to another device using a sequence program.
In addition, when the master station becomes faulty, the transferred data is transferred to the remote output RY of the standby master station using a sequence program.

(b) "Master station input" while the master station is controlling the data link



The remote I/O station data sent to the remote output RY of the standby master station is being used by the standby master station as the input information when the standby station operates as a local station; thus, it does not need to be transferred to another device.

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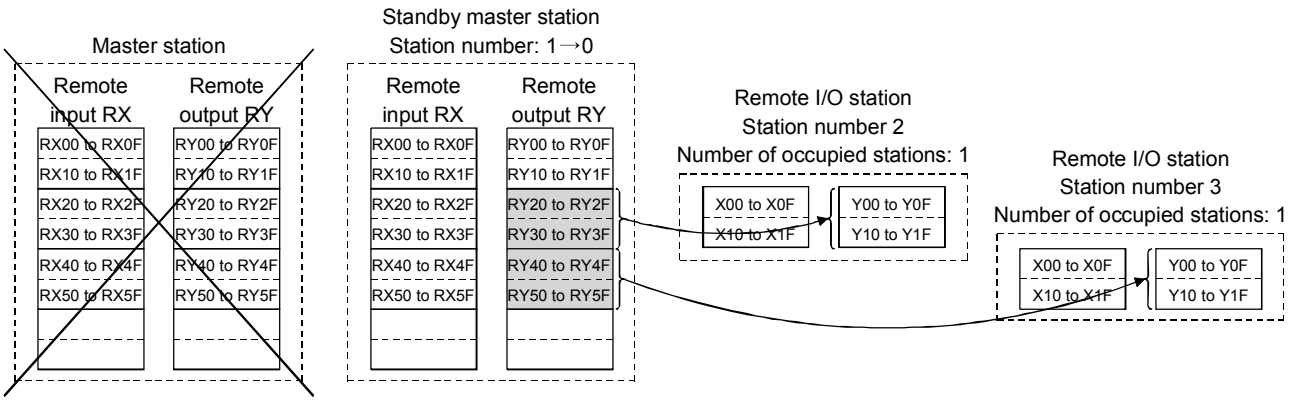
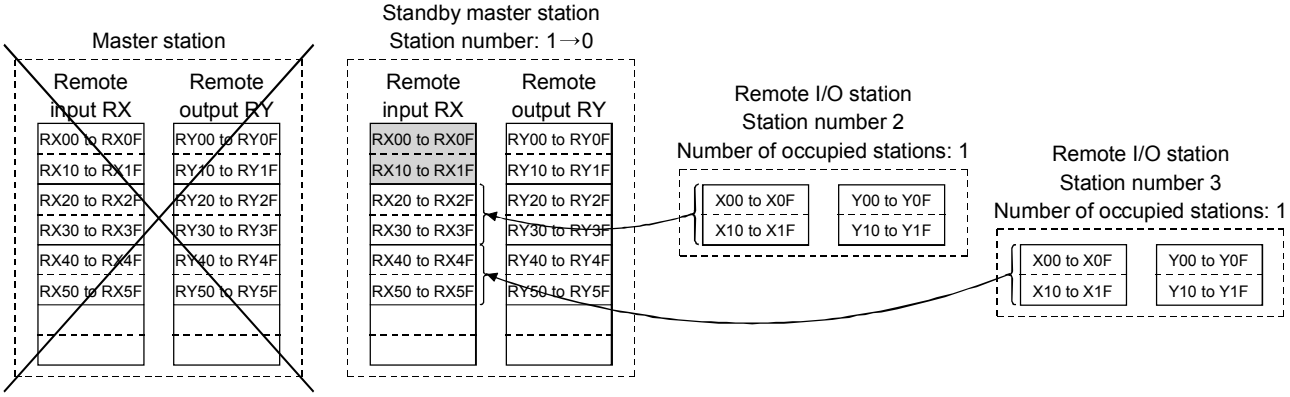
(c) "Standby master station output" when the master station is down and the standby master station is controlling the data link



The data sent to the remote output RY of the standby master station by a sequence program is sent to the remote I/O stations as output information.

(d) "Standby master station input" when the master station is down and the standby master station is controlling the data link



The data shown in the shaded areas in the standby master station is either input or retained according to the "Data link faulty station setting" in network parameters.

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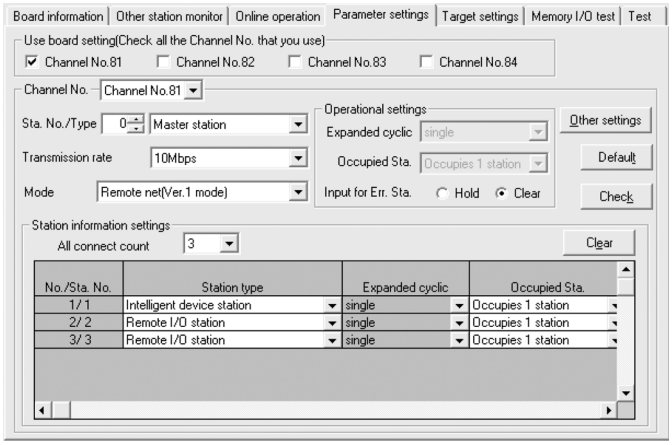
(2) Setting method

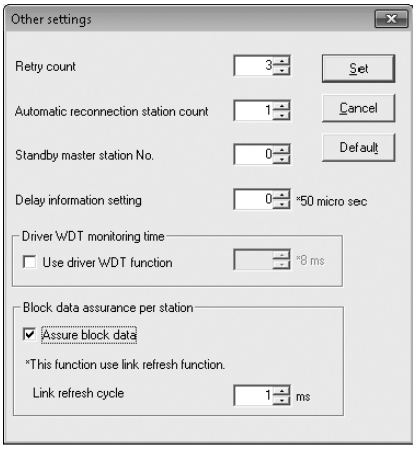
The setting is performed at <<Parameter settings>> in the CC-Link Ver.2 utility. Refer to Section 8.2.5 for details.

(a) Setting the master station

1) Set the "Sta.No." and "Type" in <<Parameter settings>>.
   Sta.No.:0
   Type: Master station



2) Set the "Standby master station" with the Other settings button.
   Setting range: 1 to 64 (No standby master station specified for blank)
   Default: 0 (No standby master station specified)

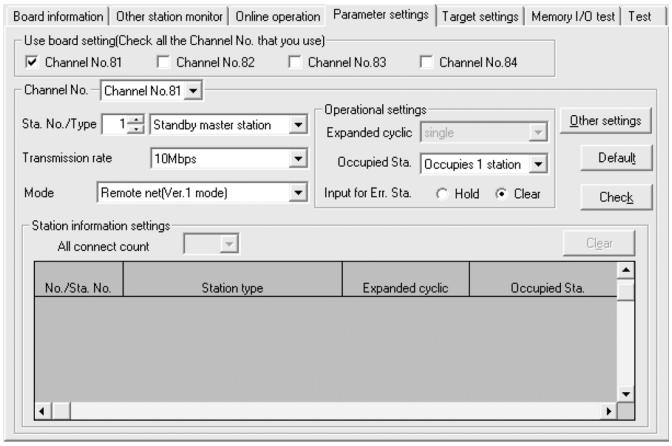


3) Select the "Ver.1 Intelligent device station" or "Ver.2 Intelligent device station" for "Type" of the station information.
   Make a selection according to the mode set in "Mode setting".

(b) Setting the standby master station

Set the same "Standby master station number" as the one set in the master station to "Sta. No." in <<Parameter settings>> and set "Standby master station" for "Type".

For "Mode setting", select the same mode as the one set in "Mode setting" of the master station.



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(3) Notes on using the standby master function

(a) Only one standby master station is allowed in a single data link system.

(b) The total number of stations can be no more than 64, including the standby master station. The number of stations that can be occupied by the standby master station is one or four.

(c) Do not specify station number 64 for a system in which a standby master station exists.
If it is specified, station number 64 cannot communicate normally.

(d) If any abnormality is detected at the master station in the initial status (before parameter communication starts), the switch to the standby master station will not be executed.

(e) When the master station becomes faulty, the data link control will automatically be transferred to the standby master station, but the cyclic transmission data will not be transferred. Instructs to perform the switching direction (SB0001 is ON) with a user program.
After switching the data link startup (SB0043) from the standby master station to the master station is completed, the information before the detection of abnormality at the master station will be output to each station.
Note that, a transient transmission to the master station cannot be performed until switching the data link startup (SB0043) from the standby master station to the master station is completed.
(If the transient transmission is performed before the switching is completed, a timeout error will occur in the request source.)
Perform transient transmission to the master station after instructing to perform the switching direction of the cyclic transmission data with a user program.

(f) The master station duplex function is not available.
The control is switched from the standby master station to the master station only once.
Therefore, if the standby master station goes down after the control has been switched to the standby master station due to master station failure, the CC-Link system will stop the data link. (The control will not be switched even if the master station functions properly.)

(g) When the master station goes down and the data link control right is switched to the standby master station, the standby master station number is identified an error number (Corresponding bits in SB0080 or SW0080 to SW0083 turn ON.) The station number of the standby master station is changed to 0 from the station number set by the parameter because there is no standby master station. The data linking is successfully performed.
Specifying a standby master station as an error invalid station prevents this kind of error detection.

(h) When the standby master station is controlling the data link, parameters cannot be updated.

(i) If the terminal block of the master station is removed and then replaced in its original position without turning the power off while the master station is controlling the data link, both the master and standby master stations will attempt to operate as master stations and an error will occur. (The "ERR." LED will be flicker.)

(j) When a programmable controller is set as the master station, a CC-Link Ver.2 board cannot be specified as a standby master station.

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(4) Special link relays/registers (SB and SW) related to the standby master function

The following explains the special link relays and registers related to the standby master function.

They are stored in the buffer memory.

(a) Special link relays (SB)

The special link relays (SB) relating to the standby master function are as follows:

The numeric values in parentheses in the number column indicate buffer memory addresses and bit locations.

Example: When the buffer memory address is 5E0H and the bit location is 0: (5E0H, b0)

Table 4.5 List of special link relays related to the standby master function

Number	Name	Description	Applicability (○Applicable, ×Not applicable)	
			Master station	Standby master station
SB0001 (5E0H,b1)	Master station switching and data link startup	Switches the output information from the standby master station to the master station, and starts up the data link. Off : Without switching direction On : With switching direction	×	○
SB0042 (5E4H,b2)	Acknowledge status of master station switching and data link startup	Shows the acknowledge status of the data link startup switching direction from the standby master station to the master station. Off : Not acknowledged On : Direction acknowledged	×	○
SB0043 (5E4H,b3)	Complete status of master station switching and data link startup	Shows the complete status of the data link startup switching direction from the standby master station to the master station. Off : Not complete On : Switching complete	×	○
SB0070 (5E7H,b0)	Master station information	Shows the data link status. Off : Data link control by the master station On : Data link control by the standby master station	○	○
SB0071 (5E7H,b1)	Standby master station information	Indicates whether or not there is a standby master station. Off : No standby master station On : Standby master station exists	○	○

(b) Special link registers (SW)

The following explains the special link registers (SW) related to the standby master function.

The numeric values in parentheses in the number column indicate buffer memory addresses.

Table 4.6 List of special link registers related to the standby master function

Number	Name	Description	Applicability (○Applicable, ×Not applicable)	
			Master station	Standby master station
SW0043 (643H)	Result of master station switching and data link startup	The execution result of the master station switching and data link startup direction by the SB0001 is stored. 0 : Normal Other than 0 : An error code is stored. (Refer to Chapter 15.)	×	○
SW0073 (673H)	Standby master station number	Stores the station number of the standby master station. 1 to 64	○	○

(5) Program example when the standby master function is used

The following shows a program example when the standby master function is used.

```
void                    Change_StanbyMaster()
{                       short           Counter;        // General counter
                        short           StNo;           // Station number
                        unsigned short  DevType;        // Device type
                        short           DevNo;          // Device number
                        short           Size;           // Sending data size
                        short           RecvBuf[10];    // Buffer for receiving
                        unsigned short  ret;            // Return value

//Turn on SB1 (switching request)
                        StNo = 0xFF;                    //Set the station number
                        DevType = 5;                    //Set the device type (SB: equivalent to special M)
                        DevNo = 0x1;                    //Set the device number
                        ret = mdDevSet(path,StNo,DevType,DevNo);
                        if(ret!=0)      {
                                        printf("SBI ON processing failed, error code:%x\n",ret);
                                        printf("Press any key\n");
                                        getch();
                                        mdClose(path);
                                        exit(0);
                        }

                        for(Counter = 0;Counter < 100;Counter++){               // Confirm completion of switching
//Read SB (equivalent to special SM) 43)
                                Size = 2;                       // Set the size of sending data
                                StNo = 0xFF;                    // Set the station number
                                DevType = 5;                    // Set the device type (SB: equivalent to special M)
                                DevNo = 0x20;                   // Set the device number
                                ret = mdReceive(path,StNo,DevType,DevNo,&Size,&RecvBuf[0]);
                                if(ret!=0){
                                        printf("mdReceive[SB43 read] processing failed, error code:%xYn";ret);
                                        printf("Press any key\n");
                                        getch();
                                        mdClose(path);
                                        exit(0);
                                }
                                if((RecvBuf[0] & 0x0800)!=0)            // Exit from the loop if SB43 is on
                                        break;
                                Sleep(100);                     // Wait for 100ms
        }
// Confirm the time-out
        if(Counter>=100){
                        printf("[SB43]ON conformation timed out \n");
```

```
                    printf("Press any key\n");
                    getch();
                    mdClose(path);
                    exit(0);
        }
//Turn on SB1 (switching request)
                    StNo = 0xFF;                    //Set the station number
                    DevType = 5;                    //Set the device type (SB: equivalent to special M)
                    DevNo = 0x1;                    //Set the device number
                    ret=mdDevRst(path,StNo,DevType,DevNo);
                    if(ret!=0)      {
                            printf("SBI ON processing failed, error code:%x\n",ret);
                            printf("Press any key\n");
                            getch();
                            mdClose(path);
                            exit(0);
        }

// Read SW (equivalent to special SD) 43 [switching result]
                    Size = 2;                               // Set the size of sending data
                    StNo = 0xFF;                            // Set the station number
                    DevType = 14;                           // Set the device type (SD: equivalent to special D)
                    DevNo=43;                               // Set the device number
                    ret=mdReceive(path,StNo,DevType,DevNo,&Size,&RecvBuf[0]);
                    if(ret!=0){
                            printf("mdReceive[SW43 read] processing failed, error code:%x\n",ret);
                            printf("Press any key\n");
                            getch();
                            mdClose(path);
                            exit(0);
                        }
                        if((RecvBuf[0] & 0x0800)!=0)                // Exit from the loop if SB43 is on
                                break;
                        Sleep(100);                             // Wait for 100ms
                    }

                    if(RecvBuf[0]!=0){                      // Exit when the switching result is abnormal
                            printf("Failed to switch to the standby master station\n");
                            printf("Press any key\n)
                            getch();
                            mdClose(path);
                            exit(0);
                    }
}
```

POINT
Use the paths that are already obtained in other processing for the path parameters in the standby master switching sample program. (They correspond to the path values obtained by mdOpen.)

4.3.5 Monitoring the operation of the software (operating system, driver) inside the hardware (Driver WDT function)

Driver WDT function monitors the operation of the software (operating system, driver) inside the hardware by the timer function on CC-Link Ver.2 board.
When the driver cannot reset the timer of the board within the specified driver WDT monitoring time, CC-Link Ver.2 board detects driver WDT error.
Driver WDT function detects driver operation delay due to the access error from the driver to CC-Link Ver.2 board or system high load.

(1) Driver WDT settings

For the setting method, refer to section 8.2.5.

REMARK

The driver WDT function is set to invalid as a default.

(2) When the driver WDT error has occurred

The following shows the operation when driver WDT error has occurred.

1) CC-Link Ver.2 board and the driver stop link refresh and communication and are disconnected from the network in order to avoid an erroneous output. A CPU stop error occurs when checking the CC-Link Ver.2 board from other station on which the driver WDT error has occurred.
2) RUN LED flicks and SD LED turns ON on the CC-Link Ver.2 board.
3) "-28158 (9202H) Driver WDT error" occurs when accessing CC-Link Ver.2 board from the application program in which the CC-Link Ver.2 utility and MELSEC data link library function are used.

POINT

(1) When the multiple applications in which MELSEC data link library is used are executed, driver WDT error is returned to all the programs. However, only the CC-Link Ver.2 board in which the driver WDT error has occurred is recognized as an error station on the network.
When using driver WDT function, set the monitoring timer considering the margin of the personal computer load.
(2) For the troubleshooting, refer to section 16.4.2.

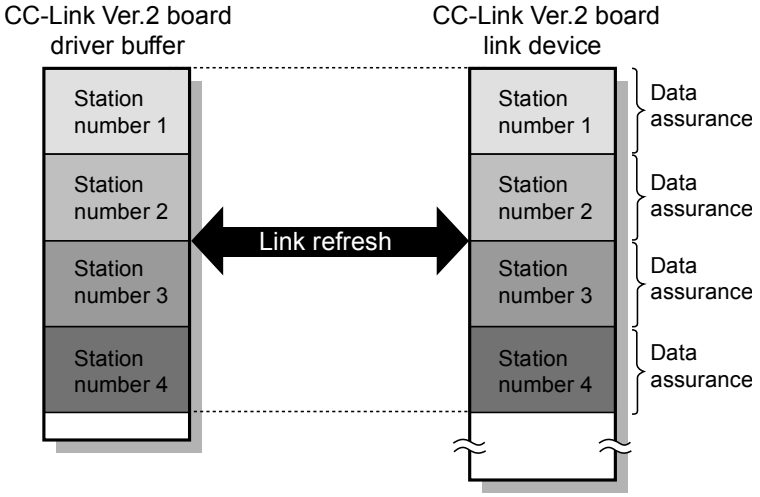
4.3.6 Station-based block data assurance function

The block data assurance per station setting refers to a prevention of separating cyclic data to new data and old data.
Cyclic data may be separated between new and old data depending on the timing of the link refresh. This function prevents read/write data per slave station from being separated between new and old data. Only by setting parameters in the CC-Link Ver.2 utility, it can be prevent separation of the data.

POINT
When using block data assurance per station setting, SW1DNC-CCBD2-B Version 1.17T or later and CC-Link Ver.2 board ROM version 2B or later are required.

(1) The target device of the block data assurance per station setting

The target device of the block data assurance per station setting is link device (RX/RY/RWr/RWw).
When the block data assurance per station is enabled, the link refresh is executed between the CC-Link Ver.2 board driver buffer (RX buffer/RY buffer/RWr buffer/RWw buffer) and the area assigned to each station in the link device. The area of the link device assigned to each station is the respective slave station and data will be assured.



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(2) Access method for link devices

The access method varies from the user program to the link device depending on the setting of block data assurance per station.

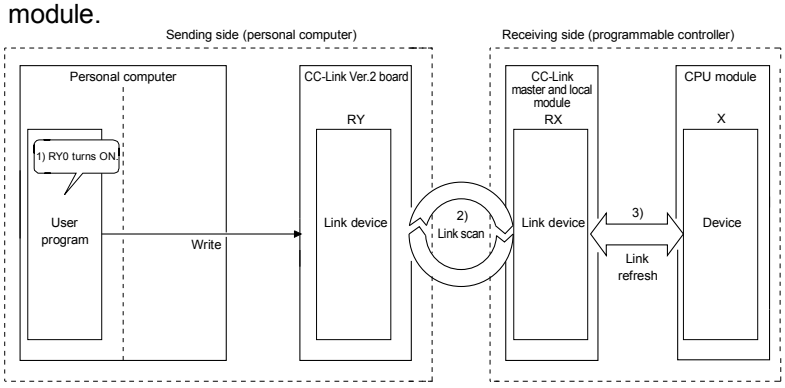
(a) In the case of block data assurance per station is disabled

Accessing (reading/writing) the data from the user program is directly carried out with respect to the link device of CC-Link Ver.2 board.

To prevent separation of the data, it is necessary to implement the data separation prevention function in the user program.

This explains the case where personal computer transmits the data (RY0) to programmable controller (X0) cyclically.

1) The link device RY0 of the CC-Link Ver.2 board on the sending side (personal computer) becomes ON when the user program turns ON the RY0.
2) By a link scan, the link device data (RY0) is stored in a link device (RX0) of CC-Link system master/local module on the receiving side.
3) By a link refresh, the data (RX0) is stored in a device (X0) of the CPU module.



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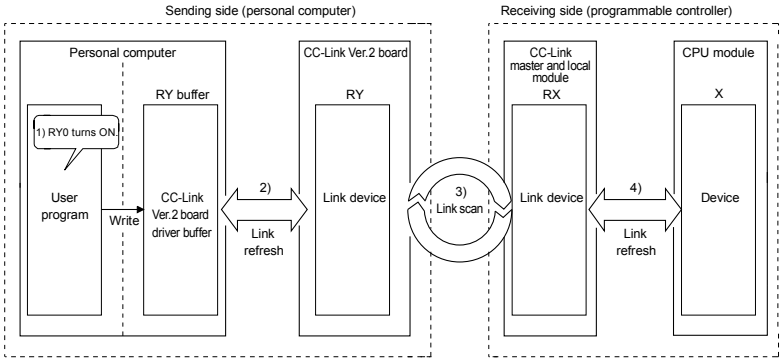
(b) In the case of block data assurance per station is enabled

The data is accessed (read/write) from the user program with respect to the CC-Link Ver.2 board driver buffer, and the data of CC-Link Ver.2 board driver buffer and CC-Link Ver.2 board link device will be updated by a link refresh.

When block data assurance per station setting is enabled, usually the link refresh will be enabled. It is possible to prevent the cyclic data separation only by setting the parameter without implementing the data separation prevention function in the user program.

This explains the case where personal computer transmits the data (RY0) to programmable controller (X0) cyclically.

1) The RY buffer 0 of the CC-Link Ver.2 board driver buffer on the sending side (personal computer) becomes ON when the user program turns ON the RY0.
2) By a link refresh, the RY buffer 0 of the CC-Link Ver.2 board driver buffer is stored in a link device (RY0) of the CC-Link Ver.2 board.
3) By a link scan, the link device data (RY0) is stored in a link device (RX0) of CC-Link system master/local module on the receiving side.
4) By a link refresh, the data (RX0) is stored in a device (X0) of the CPU module.



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(3) Link refresh

The link refresh is executed between the link device and the CC-Link Ver.2 board driver buffer.

In order to execute the link refresh, set the block data assurance per station setting and the link refresh cycle at <<Parameter settings>> ("Other settings" screen) in the CC-Link Ver.2 utility. Refer to Section 8.2.5 (2).

Link refresh time is shown on "Board information" screen ("Board detail information" screen) in the CC-Link Ver.2 utility. Refer to Section 8.2.2 (2).

However, link refresh is not executed when the board WDT error, or hardware failure occurred, or data link has stopped.

POINT

(1) If the link refresh cycle is shortened, CPU utilization of the personal computer may increase and load may become high.

(2) If the link refresh cycle is prolonged, the transmission delay time of the cyclic data may increase.

(3) Depending on the following causes, the link refresh may not be executed as per link refresh cycle set in the <<Parameter settings>> ("Other settings" screen).

- Performance of a personal computer CPU is low
- Too many link refresh points
- Too many CC-Link Ver.2 boards has been installed
- Overloading due to the other running applications
- Overloading due to the other running boards

(4) When the link refresh time checked on the "Board information" screen ("Board detail information" screen) is longer than the set link refresh cycle, take any of the following actions.

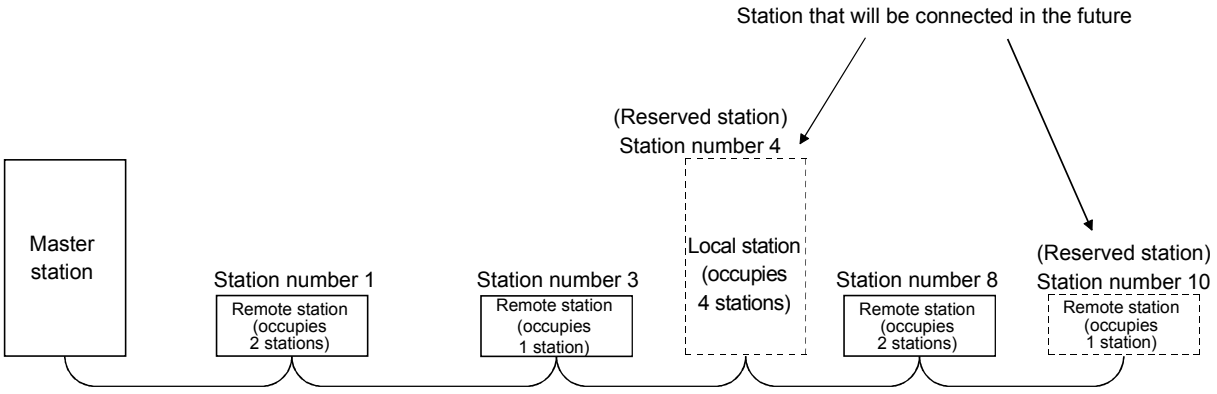
- Extend the link refresh cycle
- Decrease the remote station points of the whole network

4.4 Useful Functions

This section explains some useful functions for the CC-Link Ver.2 board.

4.4.1 Creating a program that contains modules to be added in the future (reserved station function)

This function prevents any of the remote stations, local stations, intelligent device stations and standby master station that is not actually connected (but that will be connected in the future) from being treated as a "data link faulty station" by the master and local stations.
When the master station is in the Remote net ver.2 mode, the number of points for a reserved station can be set to 0.



POINT

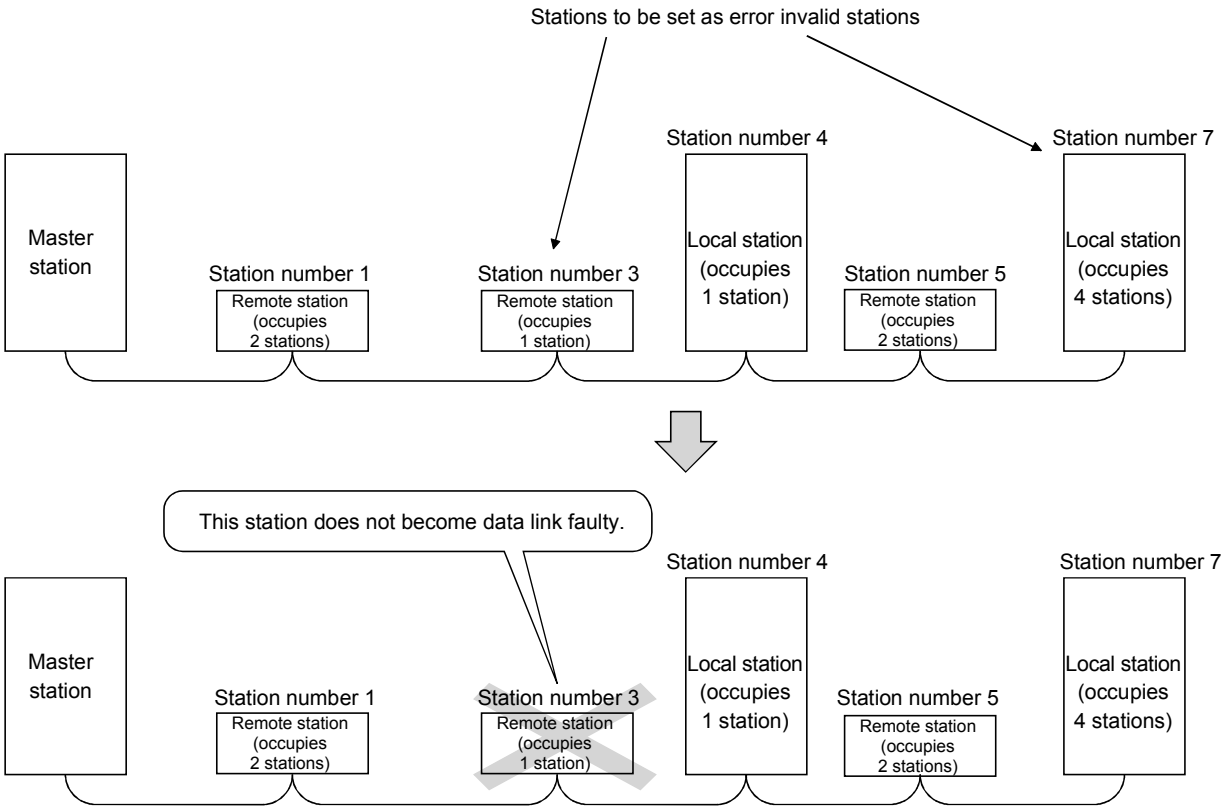
If any of the connected remote stations, local stations, intelligent device stations or standby master station is designated as a reserved station, the data link with that station will become disabled.

[Setting method]

The setting is performed at <<Parameter settings>> in the CC-Link Ver.2 utility.
Refer to Section 8.2.5 for setting details.

4.4.2 Powering off a station in operation without detecting an error (error invalid station setting function)

By setting network parameter, this function prevents any of the remote stations, local stations, intelligent device stations and standby master station that is powered off in the system configuration from being treated as a "data link faulty station" by the master and local stations.
Note that if a station is set as an error invalid station, problems occurring in that station can no longer be detected.
In addition, the error invalid station settings cannot be changed while online because they are set with network parameters.


Stations to be set as error invalid stations
Station number 4
Station number 7
Master station
Station number 1
Remote station (occupies 2 stations)
Station number 3
Remote station (occupies 1 station)
Local station (occupies 1 station)
Station number 5
Remote station (occupies 2 stations)
Local station (occupies 4 stations)
This station does not become data link faulty.
Station number 4
Station number 7
Master station
Station number 1
Remote station (occupies 2 stations)
Station number 3
Remote station (occupies 1 station)
Local station (occupies 1 station)
Station number 5
Remote station (occupies 2 stations)
Local station (occupies 4 stations)

POINT

If any of the remote stations, local stations, intelligent device stations or standby master station that has been specified as an error invalid station is also "specified as a reserved station," the reserved station function overrides the error invalid station setting function.

[Setting method]

The setting is performed at <<Parameter settings>> in the CC-Link Ver.2 utility.
Refer to Section 8.2.5 for setting details.

4.4.3 Checking operations for each station (data link stop/restart)

The circuit test (Hardware), circuit test (Software) and a Network test can be performed in the CC-Link Ver.2 utility.
For more details, refer to Section 8.2.8.

4.4.4 Station number duplicate check

This function checks whether or not multiple modules with the same station number exist in the system when the master station is started up.

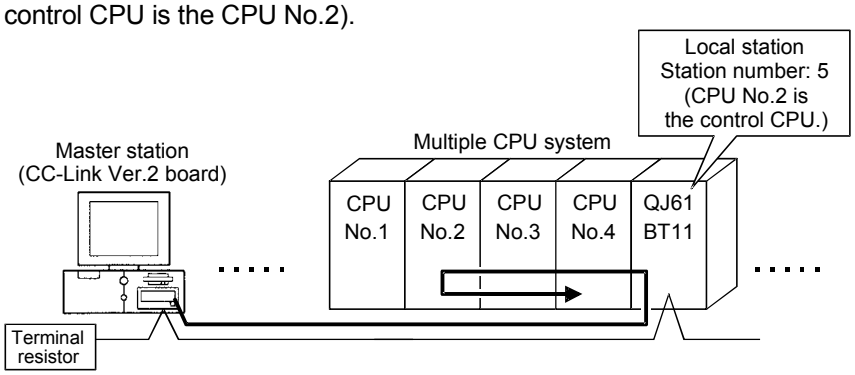
1) When there is a duplicate station number, the "ERR." LED is lit, an error code is stored in the SW006A (switch setting status), and the SB006A turns on.
2) By correcting the switch setting to normal and restarting the data link, the "ERR." LED can be turned off and the data in the SW006A can be cleared.

4.4.5 Multiple CPU system support

By setting the logical station number using the CC-Link Ver.2 utility, any CPU of a multiple CPU system in which a RJ61BT11/LJ61BT11/L26CPU-BT/L26CPU-PBT/ QJ61BT11(N) is installed can be accessed by a personal computer in which a CC-Link Ver.2 board is installed.

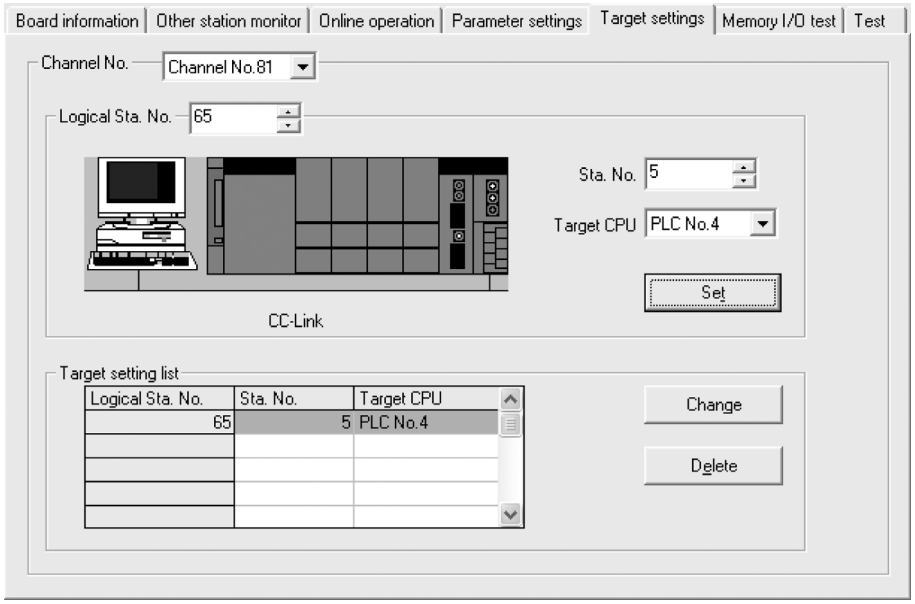
<Access example>

Using logical station number "65," an access can be made from a personal computer in which a CC-Link Ver.2 board is installed to the CPU No. 4 via a QJ61BT11(N) (the control CPU is the CPU No.2).



[Setting the logical station number]

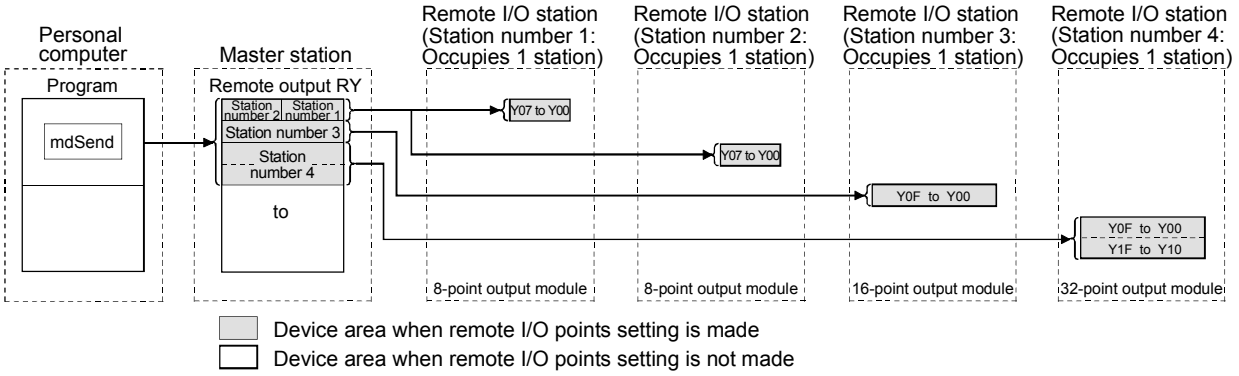
Set the logical station number in the "Target" of the CC-Link Ver.2 utility.
For details on the "Target", refer to Section 8.2.6.



POINT
Use a RJ61BT11/LJ61BT11/L26CPU-BT/L26CPU-PBT/QJ61BT11(N) of functional version B or later in order to access a multiple CPU system. A QJ61BT11(N) of functional version A cannot be used.

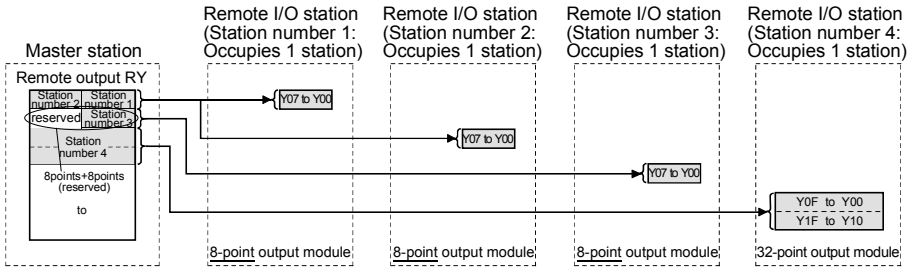
4.4.6 Reducing the reserved points of the remote I/O stations (Remote I/O station points setting)

The points of each remote I/O station can be set to 8, 16 or 32 points.
Therefore, only the points used for I/O need to be allocated for the remote devices in the CC-Link system and unused points can be reduced. It is effective for saving device points.
The remote I/O station points setting can be used in the remote net ver.2 mode only.

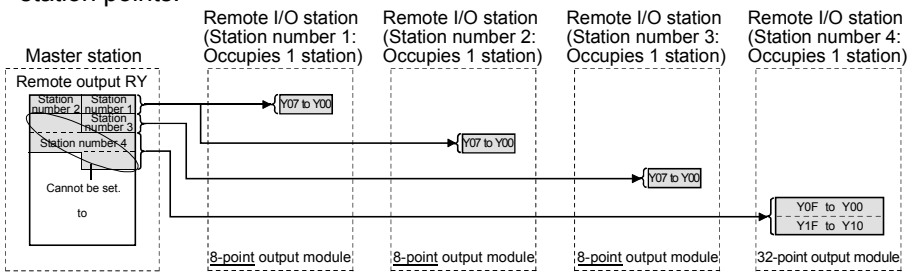

Personal computer
Program
mdSend
Master station
Remote output RY
Station number 2
Station number 1
Station number 3
Station number 4
to
Remote I/O station (Station number 1: Occupies 1 station)
Remote I/O station (Station number 2: Occupies 1 station)
Remote I/O station (Station number 3: Occupies 1 station)
Remote I/O station (Station number 4: Occupies 1 station)
Y07 to Y00
Y07 to Y00
Y0F to Y00
Y0F to Y00
Y1F to Y10
8-point output module
8-point output module
16-point output module
32-point output module
Device area when remote I/O points setting is made
Device area when remote I/O points setting is not made

POINT

(1) Set points to even-numbered 8-point setting remote I/O stations consecutively. If points are set to odd-numbered 8-point setting remote stations, select "8 points + 8 points reserved" in the "remote station points" setting of the last of the consecutive remote I/O stations.



Odd-numbered 8-point setting remote stations cannot be set for 8 remote station points.


Master station
Remote output RY
Station number 2
Station number 1
Station number 3
Station number 4
Cannot be set.
to
Remote I/O station (Station number 1: Occupies 1 station)
Remote I/O station (Station number 2: Occupies 1 station)
Remote I/O station (Station number 3: Occupies 1 station)
Remote I/O station (Station number 4: Occupies 1 station)
Y07 to Y00
Y07 to Y00
Y07 to Y00
Y0F to Y00
Y1F to Y10
8-point output module
8-point output module
8-point output module
32-point output module

Refer to Section 8.2.5 for parameter setting.

[Setting method]

The setting is performed at <<Parameter settings>> in the CC-Link Ver.2 utility. Refer to Section 8.2.5 for setting details.

(1) Precautions for remote I/O station points setting

Set the points not less than I/O points of the actually installed remote I/O station with the parameter. Otherwise, the I/O operations corresponding to the exceeded points will not function normally.

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4.4.7 Increasing the number of cyclic points (Remote net ver.2 mode, Remote net additional mode)

This function increases the number of cyclic points in the CC-Link system.
When increasing the number of cyclic points, select one from the following two modes.

- Remote net ver.2 mode ..... Mode used for configuring a new system
- Remote net additional mode..... Mode used for incorporating an additional Ver.2 compatible slave station into the existing Ver.1 system

The number of cyclic points per station can be increased as indicated in the following table.

Table 4.7

		Expanded cyclic setting			
		single	double	quadruple	octuple
Occupies 1 station	Remote I/O (RX, RY)	32 points	32 points	64 points	128 points
	Remote register (RWw, RWr)	4 points	8 points	16 points	32 points
Occupies 2 stations	Remote I/O (RX, RY)	64 points	96 points	192 points	384 points
	Remote register (RWw, RWr)	8 points	16 points	32 points	64 points
Occupies 3 stations	Remote I/O (RX, RY)	96 points	160 points	320 points	640 points
	Remote register (RWw, RWr)	12 points	24 points	48 points	96 points
Occupies 4 stations	Remote I/O (RX, RY)	128 points	224 points	448 points	896 points
	Remote register (RWw, RWr)	16 points	32 points	64 points	128 points

REMARK

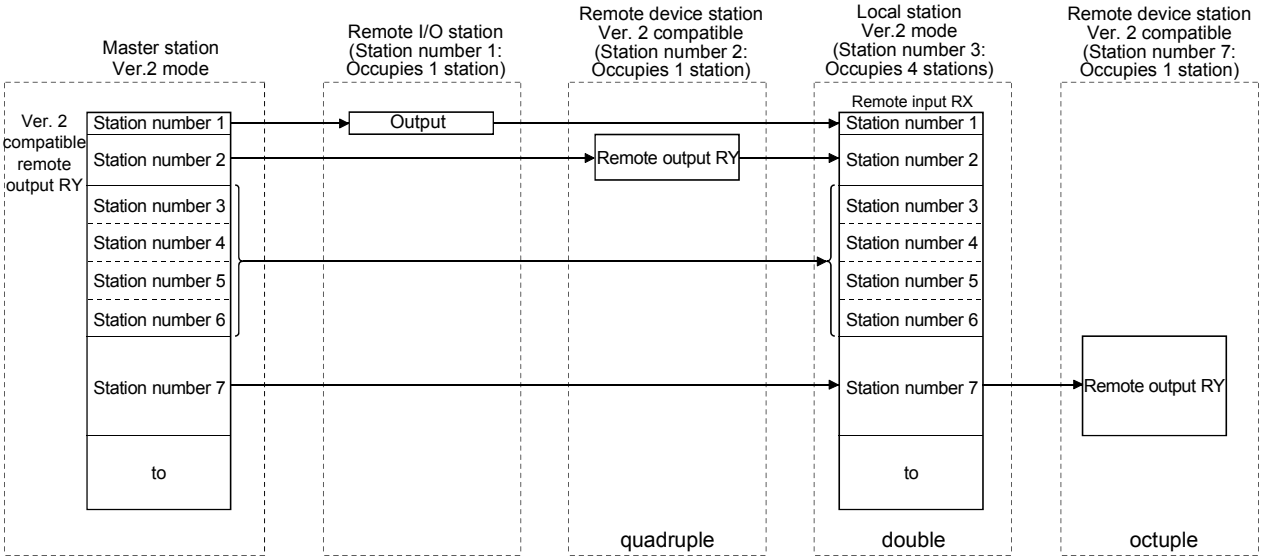
In the remote net ver.1 mode, the number of cyclic points cannot be increased.

4 - 45

(1) Remote net ver.2 mode

This mode is designed to configure a new system.
The number of cyclic points can be increased as indicated below.

- Per station, Max. RX/RY: 128 points, RWw/RWr: 32 points
  (In the case of 1 station occupied with octuple setting)
- Per CC-Link system, Max. RX/RY:8192 points, RWw/RWr: 2048 points



[Setting method]

The setting is performed at <<Parameter settings>> in the CC-Link Ver.2 utility.
Refer to Section 8.2.5 for setting details.

POINT
(1) In the remote net ver.2 mode, 0 points can be set for a reserved station.
(2) In the remote net ver.2 mode, RWw and RWr of the remote I/O station are set to 0 points. Care must be taken to calculate the word points for the programmable controller CPU side.

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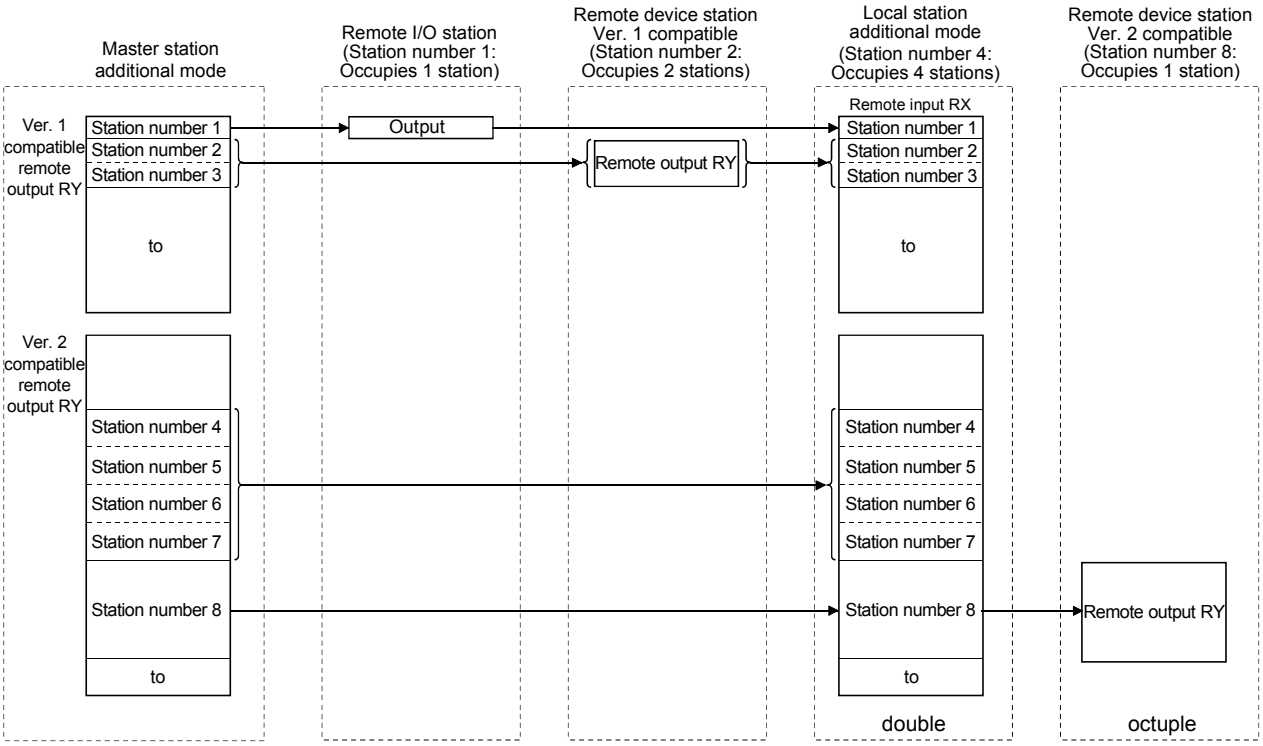
(2) Remote net additional mode

This mode is designed to be used when a CC-Link Ver.2 compatible slave station is added to the existing CC-Link Ver.1 system.
The program of the existing system can be used as is.



4 - 47

POINT

(1) Set Ver.1 compatible slave stations to the smaller station numbers, and Ver.2 compatible slave stations to greater station numbers.
In the previous page example, the Ver.2 compatible slave stations are added to after station No. 4 since the existing CC-Link Ver.1 system uses up to No. 3.

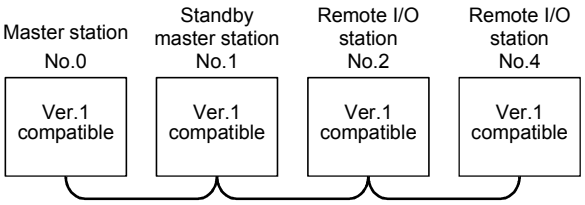
(2) The remote net additional mode assumes that the Ver.2 compatible slave stations are added to the existing CC-Link Ver.1 system.
When changing the station number of a Ver.2 compatible slave station or adding a Ver.2 compatible slave station between stations, configure them in the remote net ver.2 mode.

(3) In the remote net additional mode, I/O station points setting and reserved station 0-point setting are not available.

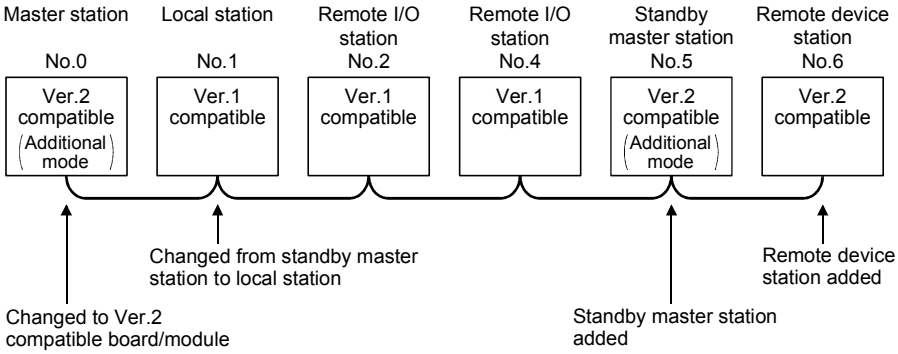
(4) When there is a possibility of adding some Ver.1 compatible slave stations in the future in the remote net additional mode, set reserved stations after the Ver.1 compatible slave station settings to make the system extension easy.

(5) The following operations are required to change the mode of the CC-Link Ver.1 system including the standby master station to the remote net additional mode.
- Changing the master station to a board or a module applicable to Ver.2.
- As a new standby master station, add a board or a module applicable to Ver.2.
- Setting the new standby master station number to larger station number than the slave station applicable to Ver.1.
- Changing the conventional standby master station to local station. (set at the parameter)

(CC-Link system before change)



(CC-Link system after change: Remote net additional mode)



[Setting method]

The setting is performed at <<Parameter settings>> in the CC-Link Ver.2 utility. Refer to Section 8.2.5 for setting details.

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(3) Precautions for cyclic points increase setting

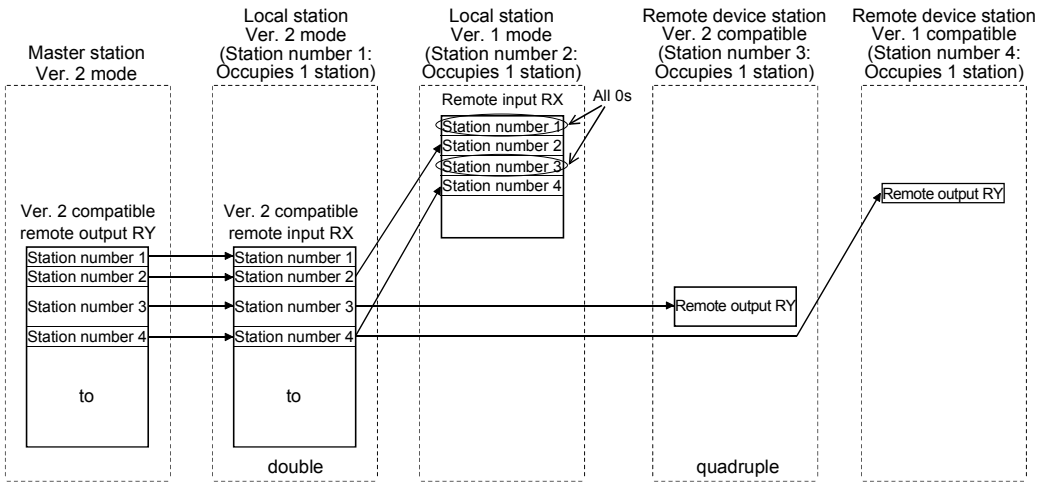
(a) Whether system can be configured or not

The following table indicates whether cyclic transmission can be made or not in each station.

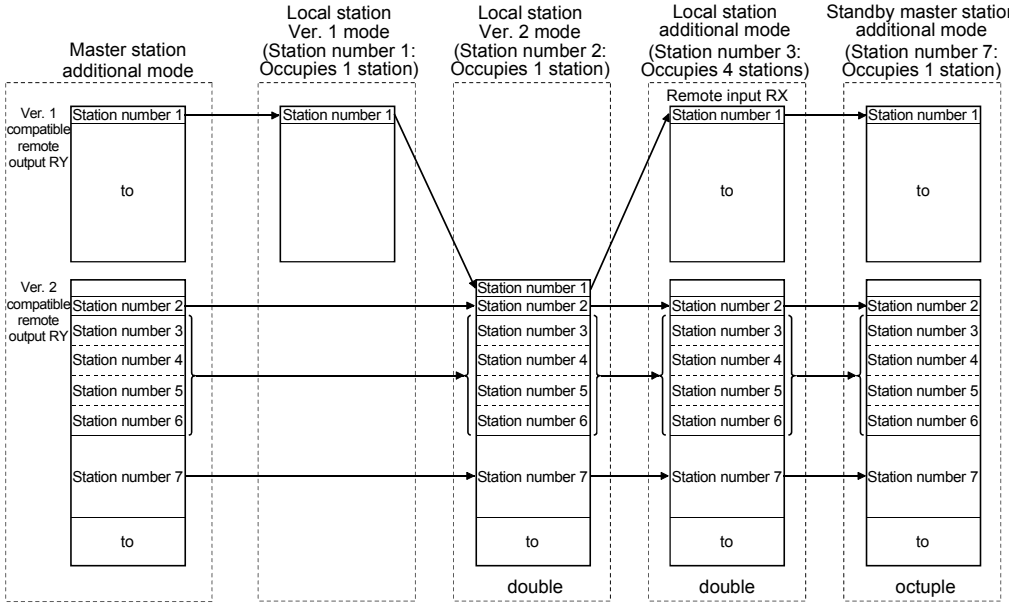
Master station \ Slave station		RJ61BT11 *5, LJ61BT11, L26CPU-BT, L26CPU-PBT, Q80BD-J61BT11N, Q81BD-J61BT11, QJ61BT11N						A80BDE-J61BT11, A80BDE-J61BT13, QJ61BT11 *4, AJ61BT11, A1SJ61BT11, AJ61QBT11, A1SJ61QBT11		Intelligent device station		Remote station		
		Local station			Standby master station			Local station	Standby master station			Remote device station		Remote I/O station
		Ver.2 mode	Additional mode	Ver.1 mode	Ver.2 mode	Additional mode	Ver.1 mode	Ver.1 mode	Ver.1 mode	Ver.2 compatible	Ver.1 compatible	Ver.2 compatible	Ver.1 compatible	Ver.1 compatible
RJ61BT11 *5, LJ61BT11, L26CPU-BT, L26CPU-PBT, Q80BD-J61BT11N, Q81BD-J61BT11, QJ61BT11N	Ver.2 mode	○	×	△ *1	△ *3	×	×	△ *1	×	○	○	○	○	○
	Additional mode	○ *2	○	△ *1	×	△ *3	×	△ *1	×	○	○	○	○	○
	Ver.1 mode	×	×	○	×	×	△ *3	○	△ *3	×	○	×	○	○
A80BDE-J61BT11, QJ61BT11 *4	Ver.1 mode	×	×	○	×	×	△ *3	○	△ *3	×	○	×	○	○

○: Cyclic transmission enabled, △: Cyclic transmission enabled on condition, ×: Cyclic transmission disabled

∗1: When the master station is in the remote net ver.2 mode or remote net additional mode and the local station is in the remote net ver.1 mode or is the QJ61BT11, the local station can communicate with the master station but cannot confirm the data of the ver.2 compatible station.



*2: When the master station is the remote net additional mode and the local station is the remote net ver.2 mode, data in other stations can be checked as shown below.


Master station additional mode
Local station Ver. 1 mode (Station number 1: Occupies 1 station)
Local station Ver. 2 mode (Station number 2: Occupies 1 station)
Local station additional mode (Station number 3: Occupies 4 stations)
Standby master station additional mode (Station number 7: Occupies 1 station)
Remote input RX
Ver. 1 compatible remote output RY
Ver. 2 compatible remote output RY
Station number 1
Station number 2
Station number 3
Station number 4
Station number 5
Station number 6
Station number 7
to
double
double
octuple

*3: When the CC-Link Ver.1 board or the CC-Link Ver.2 board is set as the standby master station, set the CC-Link Ver.1 board or the CC-Link Ver.2 board respectively as the master station.
Refer to Section 2.2 (1) for combinations of the master station and the standby master station.

*4: The remote net ver.2 mode and remote net additional mode cannot be used with the QJ61BT11.

*5: The additional mode is not supported.

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(b) Whether send/receive is enabled or not

The following table indicates whether send/receive of cyclic data is enabled or not.

Send station \ Receive station				RJ61BT11*1, LJ61BT11, L26CPU-BT, L26CPU-PBT, Q80BD-J61BT11N, Q81BD-J61BT11, QJ61BT11N							
				Master station							
				Ver.2 mode		Additional mode		Ver.1 mode		Ver.2 mode	
				Ver.2 compatible area	Ver.1 compatible area	Ver.2 compatible area	Ver.1 compatible area	Ver.2 compatible area	Ver.1 compatible area	Ver.2 compatible area	Ver.1 compatible area
RJ61BT11*1, LJ61BT11, L26CPU-BT, L26CPU-PBT, Q80BD-J61BT11N, Q81BD-J61BT11, QJ61BT11N	Master station	Ver.2 mode	Ver.2 compatible area	—	—	—	—	—	—	○	—
			Ver.1 compatible area	—	—	—	—	—	—	—	—
		Additional mode	Ver.2 compatible area	—	—	—	—	—	—	○	—
			Ver.1 compatible area	—	—	—	—	—	—	○	—
		Ver.1 mode	Ver.2 compatible area	—	—	—	—	—	—	—	—
			Ver.1 compatible area	—	—	—	—	—	—	×	—
	Local station	Ver.2 mode	Ver.2 compatible area	○	—	○	×	—	×	○	—
			Ver.1 compatible area	—	—	—	—	—	—	—	—
		Additional mode	Ver.2 compatible area	—	—	○	×	—	—	○	—
			Ver.1 compatible area	—	—	—	—	—	—	—	—
		Ver.1 mode	Ver.2 compatible area	—	—	—	—	—	—	—	—
			Ver.1 compatible area	○	—	×	○	—	○	○	—
A80BDE-J61BT11, QJ61BT11	Master station	Ver.1 compatible		—	—	—	—	—	—	×	—
A80BDE-J61BT11, A80BDE-J61BT13, QJ61BT11	Local station	Ver.1 compatible		○	—	×	○	—	○	○	—
Intelligent device station		Ver.2 compatible		○	—	○	×	—	×	○	—
		Ver.1 compatible		○	—	×	○	—	○	○	—
Remote device station		Ver.2 compatible		○	—	○	×	—	×	○	—
		Ver.1 compatible		○	—	×	○	—	○	○	—
Remote I/O station		Ver.1 compatible		○	—	×	○	—	○	○	—

*1: The additional mode is not supported.

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RJ61BT11*1 LJ61BT11 L26CPU-BT L26CPU-PBT Q80BD-J61BT11N Q81BD-J61BT11 QJ61BT11N				A80BDE-J61BT11 QJ61BT11	A80BDE-J61BT11 A80BDE-J61BT13 QJ61BT11	Intelligent device station		Remote device station		Remote I/O station
Local station				Master station	Local station					
Additional mode		Ver1 mode								
Ver.2 compatible area	Ver.1 compatible area	Ver.2 compatible area	Ver.1 compatible area	Ver.1 compatible	Ver.1 compatible	Ver.2 compatible	Ver.1 compatible	Ver.2 compatible	Ver.1 compatible	Ver.1 compatible
—	—	—	○	—	○	○	○	○	○	○
—	—	—	—	—	—	—	—	—	—	—
○	×	—	—	—	×	○	×	○	×	×
×	○	—	○	—	○	×	○	×	○	○
—	—	—	—	—	—	—	—	—	—	—
—	—	—	○	—	○	—	○	—	○	○
○	—	—	×	×	×	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—
○	×	—	×	×	×	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—
×	○	—	○	○	○	—	—	—	—	—
×	×	—	○	—	○	×	○	×	○	○
×	○	—	○	○	○	—	—	—	—	—
○	×	—	×	×	×	—	—	—	—	—
×	○	—	○	○	○	—	—	—	—	—
○	×	—	×	×	×	—	—	—	—	—
×	○	—	○	○	○	—	—	—	—	—
×	○	—	○	○	○	—	—	—	—	—

○: Cyclic transmission enabled, ×: Cyclic transmission disabled, —:Prohibited

*1: The additional mode is not supported.

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The following table indicates whether send/receive of transient data is enabled or not.

Send station \ Receive station		Master station			Local station			Intelligent device station	
		Ver.2 mode	Additional mode	Ver.1 mode	Ver.2 mode	Additional mode	Ver.1 mode	Ver.2 mode	Ver.1 mode
Master station	Ver.2 mode	—	—	—	○	—	○	○	○
	Additional mode	—	—	—	○	○	○	○	○
	Ver.1 mode	—	—	—	—	—	○	—	○
Local station	Ver.2 mode	○	○	—	○	○	×	—	—
	Additional mode	—	○	—	○	○	×	—	—
	Ver.1 mode	○	○	○	×	×	○	—	—
Intelligent device station	Ver.2 mode	○	○	—	—	—	—	—	—
	Ver.1 mode	○	○	○	—	—	—	—	—

○: Transient transmission enabled, ×: Transient transmission disabled, —: Prohibited

(4) Mismatch between parameter settings and points for the stations actually mounted

If the extended cyclic parameter setting on the master station is not consistent with the link points for each station that is actually connected, an error code is stored into SW0069 of the Q80BD-J61T11N at the master station. Also, consistency status of each station is stored into SW009C.
When an error code is stored into SW0069, reexamine the parameter settings.

POINT

For details of link special register, refer to Appendix 2.2.

(5) Precautions for modes between the master and local/standby master stations

At any of the following settings, an error (error code: B3A0) will occur at the local station/standby master station.

- The mode set at the master station differs from the mode set at the standby master station.
- When the master station is in the remote net ver.1 mode, the local station setting is the remote net ver.2 mode or remote net additional mode.
- When the master station is in the remote net ver.2 mode, the local station is in the remote net additional mode.

If an error has occurred, correct the mode parameter of the master station/local station/standby master station.

4.5 Transient Transmission Functions

The following explains the transient transmission functions.

4.5.1 Performing transient transmission (functions)

The following functions can be used for transient transmission.

Target station	Instruction	Description
Master station, local station, intelligent device station	mdReceive	Reads data from the buffer memory of the designated station or the programmable controller CPU device of the designated station.
	mdSend	Writes data to the buffer memory of the designated station or the programmable controller CPU device of the designated station.
Local station	mdRandR	Reads data from the randomly specified CPU device of the specified station.
	mdRandW	Writes data to the randomly designated CPU device of the designated station.
	mdDevSet	Sets the CPU device (bit device) of the designated device.
	mdDevRst	Resets the CPU device (bit device) of the designated device.

REMARK

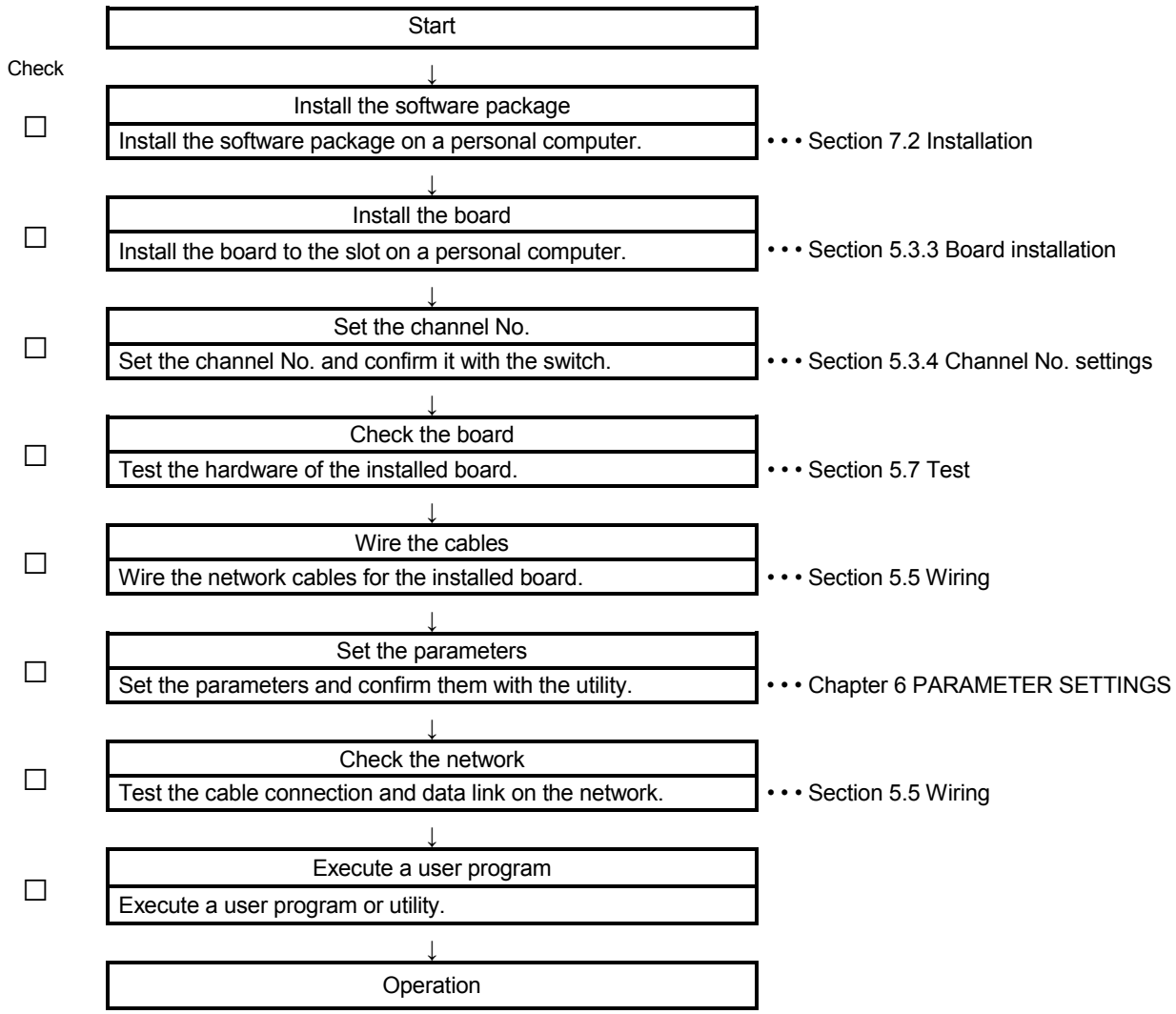
Transient transmission is performed only when these functions are executed to other stations.

5 PROCEDURE BEFORE STARTING THE DATA LINK

This chapter explains the operating procedures required before starting the CC-Link Ver.2 board operation as well as the names and settings of the CC-Link Ver.2 board components, the wiring method, and how to perform hardware tests.

5.1 Procedures Before Operating the CC-Link Ver.2 Board

The following flowchart explains the procedures before operating the CC-Link Ver.2 board.

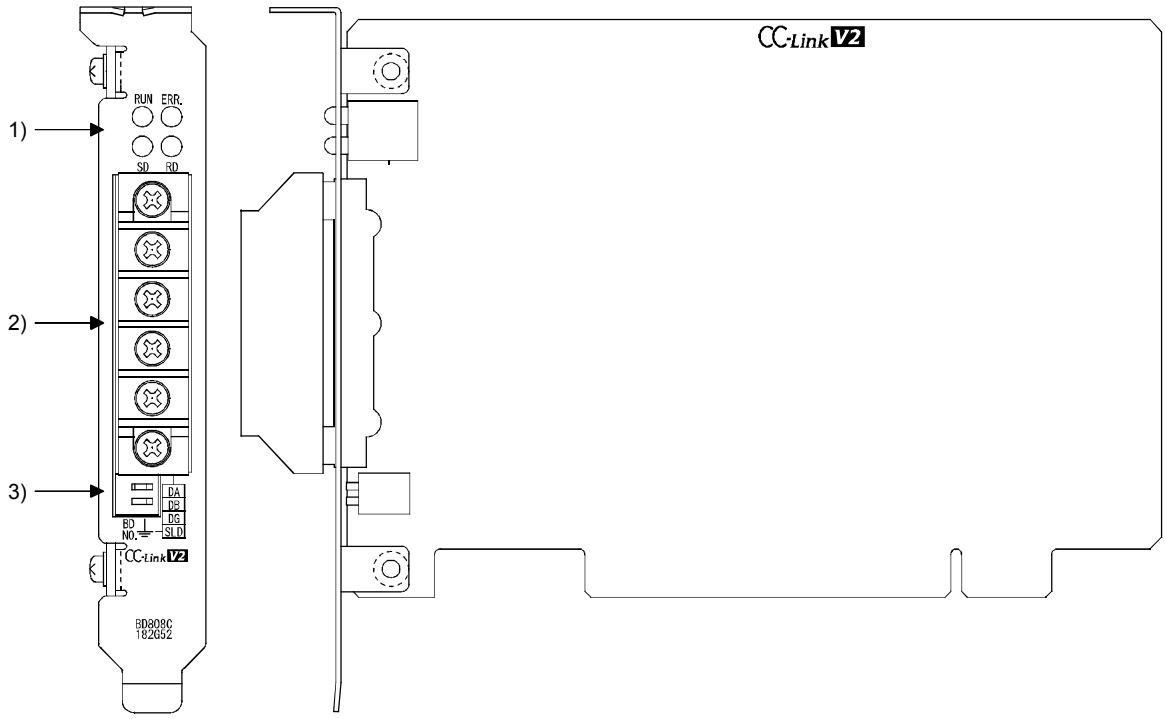

Start
Check
Install the software package
Install the software package on a personal computer.
• • • Section 7.2 Installation
Install the board
Install the board to the slot on a personal computer.
• • • Section 5.3.3 Board installation
Set the channel No.
Set the channel No. and confirm it with the switch.
• • • Section 5.3.4 Channel No. settings
Check the board
Test the hardware of the installed board.
• • • Section 5.7 Test
Wire the cables
Wire the network cables for the installed board.
• • • Section 5.5 Wiring
Set the parameters
Set the parameters and confirm them with the utility.
• • • Chapter 6 PARAMETER SETTINGS
Check the network
Test the cable connection and data link on the network.
• • • Section 5.5 Wiring
Execute a user program
Execute a user program or utility.
Operation

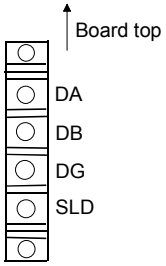
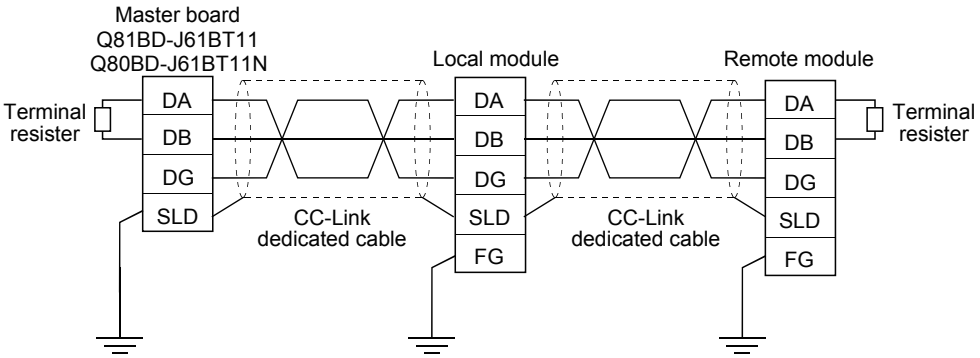
CAUTION

When using the CC-Link Ver.2 board as a local board, the setting on the master station side is required to operate the CC-Link system.
For the master station setting, refer to the user's manual of the board/module which is used as the master station.

5.2 Component Names and Settings

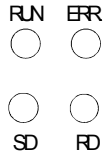
This section explains the component names and settings of the CC-Link Ver.2 board.



No.	Name	Description
1)	Indicator LED	Shows the CC-Link Ver.2 board status or communication status. Refer to (1) in this section
2)	Terminal block for data link 	Connects CC-Link dedicated cables for data link. (2-piece terminal block) 
3)	Channel No. setting switch 	Sets the board No. corresponding to the channel No. used for accessing the CC-Link Ver.2 board from the user program. (Factory default: Channel No. 81) Set unique board Nos. when installing more than one CC-Link Ver.2 board. (Refer to Section 5.3.4)

(1) Indicator LED

Display the operating status of the CC-Link Ver.2 board status.



(a) When the RUN LED is ON or OFF

The same LED display as a network module.

Name	Status	Description
RUN	ON	Operating normally
	OFF	One of the following error has occurred. • Board WDT error (Hardware failure) • Board resetting (The driver is not started.)
ERR.	ON	Communication error Confirm the error with LED status displayed on "Board detail information" screen of CC-Link Ver.2 utility. (Refer to Section 8.2.2)
	Flashing	One of the following error has occurred. • A data link faulty station was detected. • The station number is already in use.
	OFF	Operating normally
SD	ON	Sending data
	OFF	Not sending data
RD	ON	Receiving data
	OFF	Not receiving data

(b) When the RUN LED is flashing

An error which is peculiar to boards has occurred.

Refer to the troubleshooting and take corrective action. (Refer to Section 16.4.3)

Name	Status	Description
RUN	Flashing	One of the following error has occurred. (Check ERR.LED, SD LED and RD LED.)
ERR.	ON	Operating system startup error has occurred.
SD	ON	Driver WDT error has occurred.
RD	ON	PCI bus error has occurred.

5.3 Installation

This section explains the handling precautions and installation environment of the CC-Link Ver.2 board.

5.3.1 Precautions on handling the CC-Link Ver.2 board

The following explains the handling precautions of the CC-Link Ver.2 board:

⚠CAUTION

- Do not directly touch the conductive area or electronic components of the board.
  Doing so may cause malfunction or failure in the board.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the board.
  Failure to do so may cause a failure or malfunctions of the board.
- While handling the board, be sure to keep it free of static electricity.
  Static electric charges may damage the board or result in malfunction.
- Be careful not to let foreign objects such as swarf or wire chips get inside the personal computer.
  They may cause fires, failure or malfunction.
- Do not drop the board and the terminal block or subject it to any excessive shock.
  It may damage the board and the terminal block or result in malfunction.
- Do not disassemble or modify board.
  Doing so could cause failure, malfunction, injury or fire.
- When disposing of this product, treat it as industrial waste.

5.3.2 Installation environment

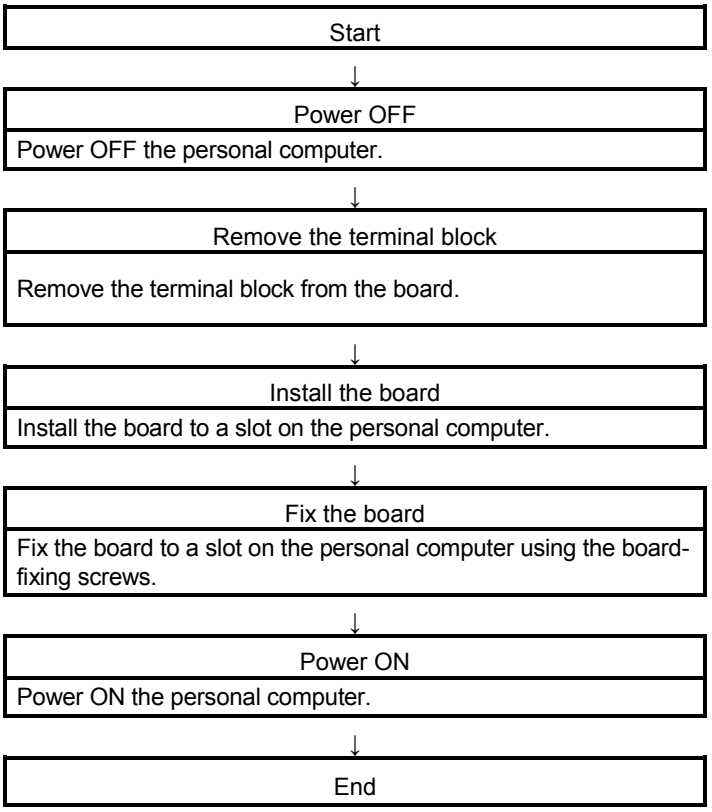
Refer to the instruction manual provided with the personal computer for information on how to install the personal computer in which the CC-Link Ver.2 board has been mounted.

⚠CAUTION

- Use the board in an environment that meets the general specifications contained in this user's manual.
  Using this board in an environment outside the range of the general specifications may cause electric shock, fire, malfunction, and damage to or deterioration of the product.
- Always ground the SLD terminal of the board and the personal computer to the protective ground conductor.
  Not doing so can cause a malfunction.

5.3.3 Board installation

The following flowchart shows the board installation procedure.


Start
Power OFF
Power OFF the personal computer.
Remove the terminal block
Remove the terminal block from the board.
Install the board
Install the board to a slot on the personal computer.
Fix the board
Fix the board to a slot on the personal computer using the board-fixing screws.
Power ON
Power ON the personal computer.
End

• • • Section 5.4.2 (1) Mounting and removing a terminal block

For the installation method of the board to a slot, refer to the instruction manual provided with the personal computer.

⚠CAUTION

- Fix the board by tighten the board-fixing screws within the specified torque range. Under tightening may cause malfunction. Over tightening may damage the screw and/or module, resulting in drop, short circuit, or malfunction. For the tightening torque of the board fixing screws, refer to the manual supplied with the personal computer.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the board.
  Failure to do so may cause a failure or malfunctions of the board.
- Be sure to shut off all phases of the external power supply used by the system before installing or removing the board. If all power is not turned off, not doing so may cause damage to the product.
- Install the board to a personal computer which is compliant with PCI standard or PCI Express® standard (Refer to Section 2.3). Failure to do so may cause a failure or malfunction.
- Securely mount the board to the PCI slot of the mounting device.
  If the board is not mounted correctly, this may lead to malfunctioning, failure or cause the board to fall.
- When mounting the board, take care not to become injured by the components that are installed or surrounding materials.
- When installing the board, take care not to contact with other boards.
- When mounting the board, take care not to become injured by the components that are installed or surrounding materials.
- When turning on the power and operating the module after installation and wiring, always attach the computer's main cover.
  Failure to do so may cause an electric shock.

5.3.4 Setting Channel Numbers

Channel number is set per board, and used to identify the board. 81 is set for the board channel number as a factory default and the range of 81 to 84 can be set.
Channel numbers being set are used to specify the target boards in setting parameters and performing the MELSEC data link library function. When using two or more boards in a single personal computer, set channel numbers not to overlap.

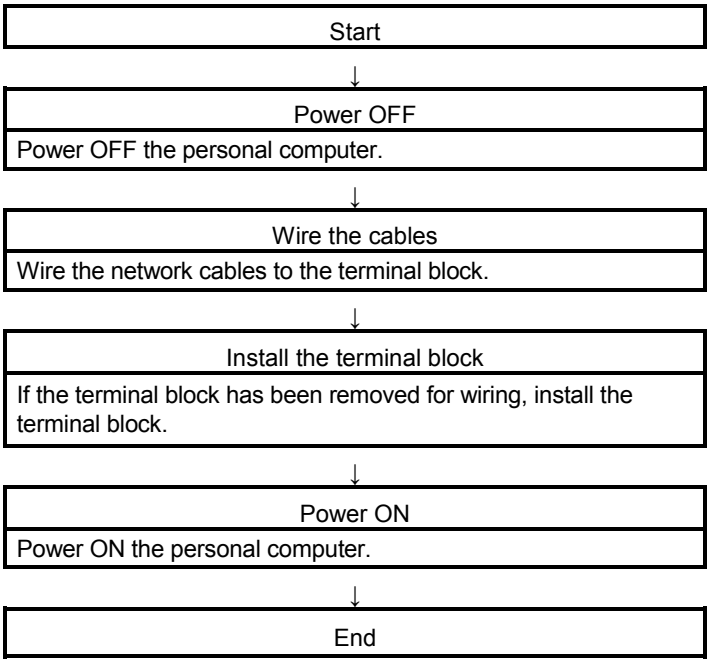
(1) Setting method

Set the channel number with the channel No. setting switch.

Channel No. setting switch		Channel Number			
		81	82	83	84
	1	OFF	ON	OFF	ON
	2	OFF	OFF	ON	ON

5.4 Wiring

This section explains the cable wiring and precautions.
The following shows the wiring procedure.


Start
Power OFF
Power OFF the personal computer.
Wire the cables
Wire the network cables to the terminal block.
Install the terminal block
If the terminal block has been removed for wiring, install the terminal block.
Power ON
Power ON the personal computer.
End

• • • Section 5.4.2 (1) Mounting and removing a terminal block

5.4.1 Preparation before wiring

Before wiring, check the cables and terminating resistors to be used.

(1) Cables that can be used

The following cables can be used:
• Ver.1.10-compatible CC-Link dedicated cable
• CC-Link dedicated cable (Ver.1.00-compatible)
• CC-Link dedicated high-performance cable (Ver.1.00-compatible)
These cables cannot be used together. If used, normal data transmission is not guaranteed.

(2) The order of connecting the cables

The cables do not have to be connected in the order of station number.

(3) Terminating resistors to be used

Connect the terminating resistors included with the stations at both ends of the stations in the CC-Link system.
The terminating resistors to be used vary depending on the cable.

Cable type	Terminating resistor to be used
Ver.1.10-compatible CC-Link dedicated cable	110Ω 1/2W (Brown-Brown-Brown)
CC-Link dedicated cable (Ver.1.00-compatible)	
CC-Link dedicated high-performance cable (Ver.1.00-compatible)	130Ω 1/2W (Brown-Orange-Brown)

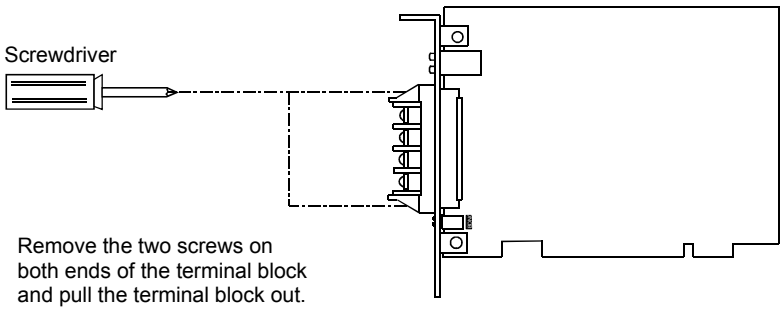
5.4.2 Terminal block

A 2-piece terminal block is required for CC-Link Ver.2 board.
The terminal block can be removed when there is difficulty in wiring work with installing the board on the personal computer.
The CC-Link Ver.2 board can be replaced without disconnecting the signal line to the terminal block.

(1) Mounting and removing a terminal block

(a) Removal procedure

1. Loosen the terminal block mounting screw.
2. Remove the terminal block.



(b) Mounting procedure

1. Mount the terminal block.
2. Tighten the terminal block mounting screws.

⚠CAUTION

- Be sure to turn off the power supply to the applicable station before installing or removing the terminal block. If the terminal block is installed or removed without turning off the power supply to the applicable station, correct data transmission cannot be guaranteed.
- Do not drop the board and the terminal block or subject it to any excessive shock. It may damage the board and the terminal block or result in malfunction.
- Tighten the terminal screws within the range of specified torque. If the terminal screws are loose, it may cause short circuits or malfunction. If the terminal screws are tightened too much, it may cause damage to the screw and/or the board, resulting in short circuits or malfunction.
- Do not touch the terminal while the power is on. Doing so may cause malfunction.
- When turning on the power and operating the module after wiring is completed, always attach the terminal cover that comes with the product. There is a risk of malfunction if the terminal cover is not attached.

(2) Solderless terminal

Use an applicable solderless terminal (1.25-3) for wiring and tighten a solderless terminal within the specified torque range. Use a UL-listed solderless terminal and a tool recommended by the manufacturer of the solderless terminal for processing. Solderless terminals with sleeves cannot be used.

⚠CAUTION

- Solderless terminals with insulation sleeve cannot be used for the terminal block. It is recommended that the wiring connecting sections of the solderless terminals will be covered with a marking tube or an insulation tube.
- Use applicable solderless terminals and tighten them with the specified torque. If any solderless spade terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- Be sure to tighten any unused terminal screws within a tightening torque range (0.66 to 0.89N.m). Failure to do so may cause a short circuit due to contact with a solderless terminal.

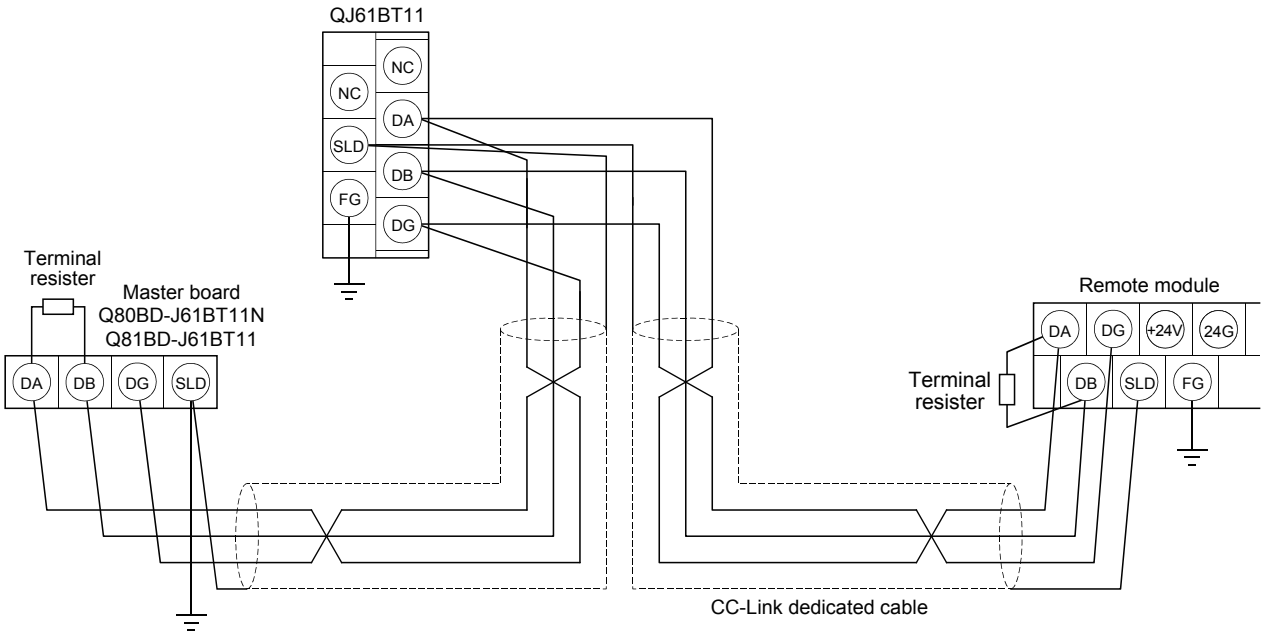
(3) Screws and tightening torque

Tighten the terminal block mounting screws and terminal block terminal screws of the CC-Link Ver.2 board using a torque within the following ranges.

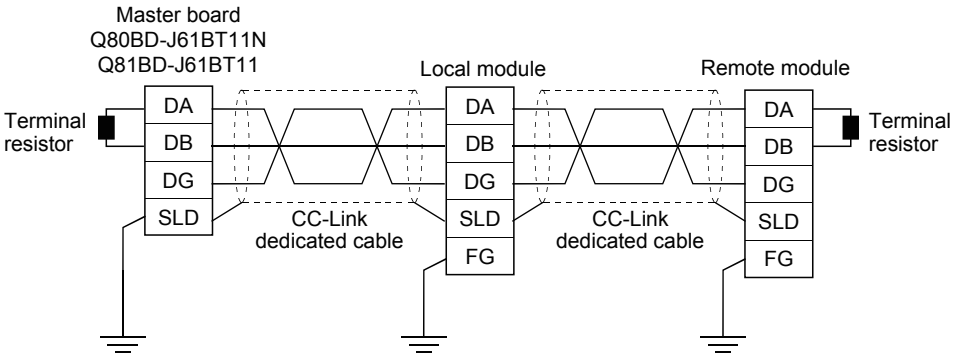
Screw type	Tightening torque range
Terminal block screw (M3.5 screw)	0.66 to 0.89N·m
Terminal block mounting screw (M3.5 screw)	0.66 to 0.89N·m

5.4.3 Wiring procedure

Connect a CC-Link dedicated cable to the terminal block of the CC-Link Ver.2 board.



[Simplified diagram]



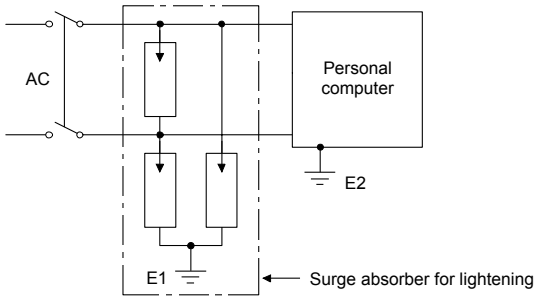
POINT

- Connect the terminating resistors between the DA and DB terminals.
- Connect the shielded cable of CC-Link dedicated cable to the "SLD" terminal, and ground the D class grounding (the third class grounding).
- No restrictions apply to the connection order of a master/local module. (The cables need not be connected in the order of station number.)
- The star topology cannot be used. Note, however, that the T-branch connection can be used. For the T-branch connection, refer to Section 5.4.4.
- Each module has a different terminal block layout. Exercise caution when wiring the system.

⚠CAUTION

- Be sure to shut off all phases of the external power supply used by the system before installing or removing the board and wiring. Not doing so may cause damage to the product.
- When turning on the power and operating the module after installation and wiring, always attach the computer's main cover. Failure to do so may cause an electric shock.
- Always ground the SLD terminal of the board and the personal computer to the protective ground conductor. Not doing so can cause a malfunction.
- Prevent foreign matter such as swarf or wire chips from being attached onto the board. Failure to do so may cause fires, failure or malfunction.
- Be sure to fix the wires or cables connected to the board by placing them in a duct or clamping them. If not fixed, cables may be dangled and accidentally pulled, causing damage to the board and cables and malfunction due to bad cable contacts.
- Do not install the control lines together with the communication cables, or bring them close to each other. Doing so may cause malfunctions due to noise.
- When removing the communication cable or power supply cables from the board, do not pull the cable. First loosen the screws where the cable is connected to the board and then remove the cable. Pulling the cable that is connected to the board may cause damage to the board and cable or malfunction due to bad cable contacts.
- Always make sure to power off the system in advance when removing the terminating resistor to charge the system. If the terminating resistor is removed and mounted while the system is energized, normal data transmission will not be guaranteed.

(1) As a countermeasure to power surge due to lightening, connect a surge absorber for lightening as shown below.



POINT

(1) Separate the ground of the surge absorber for lightening (E1) from that of the personal computer (E2).

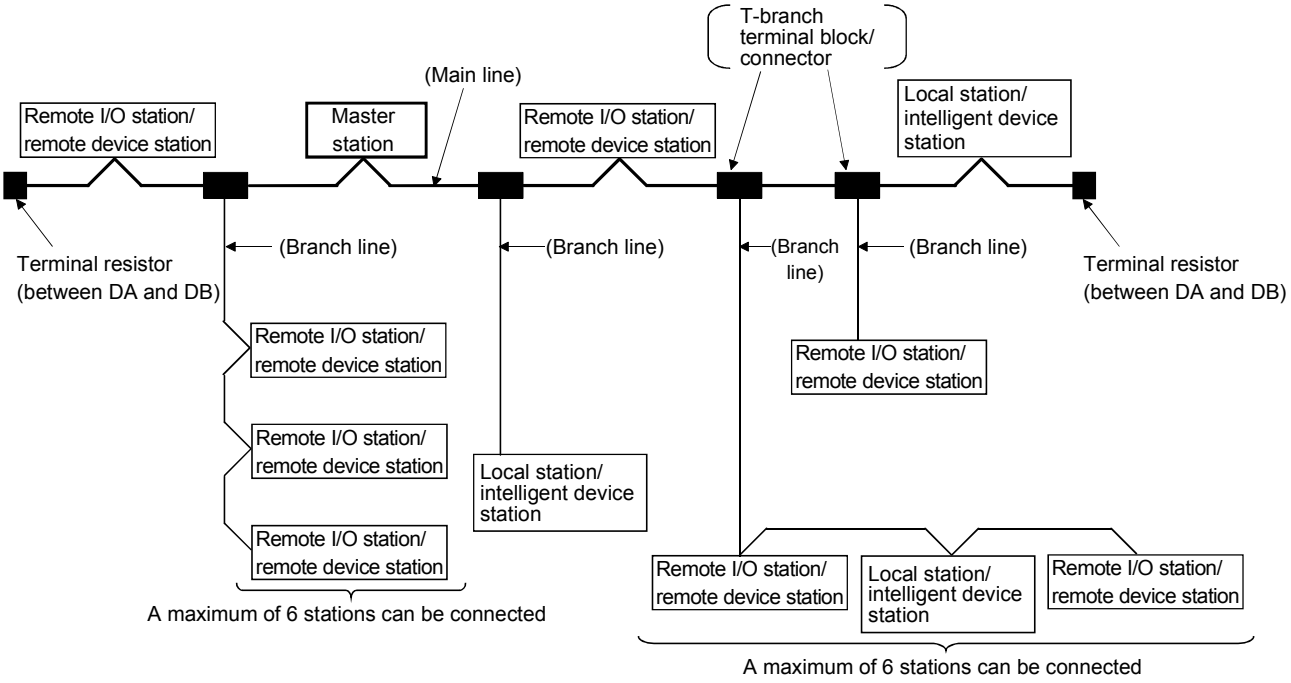
(2) Select a surge absorber for lightening whose power supply voltage does no exceed the maximum allowable circuit voltage even at the time of maximum power supply voltage elevation.

5.4.4 T-branch connection

This section explains how to perform a T-branch connection using the CC-Link dedicated cable.

(1) T-Branch system configuration

The following shows a system configuration using T-branch connection.


T-branch terminal block/ connector
(Main line)
Remote I/O station/ remote device station
Master station
Remote I/O station/ remote device station
Local station/ intelligent device station
Terminal resistor (between DA and DB)
(Branch line)
(Branch line)
(Branch line)
(Branch line)
Terminal resistor (between DA and DB)
Remote I/O station/ remote device station
Remote I/O station/ remote device station
Remote I/O station/ remote device station
Local station/ intelligent device station
Remote I/O station/ remote device station
A maximum of 6 stations can be connected
Remote I/O station/ remote device station
Local station/ intelligent device station
Remote I/O station/ remote device station
A maximum of 6 stations can be connected

∗ The number of branch lines is determined bythe branch line length per branch line and the overall branch line length.

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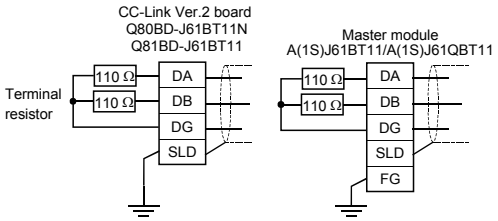
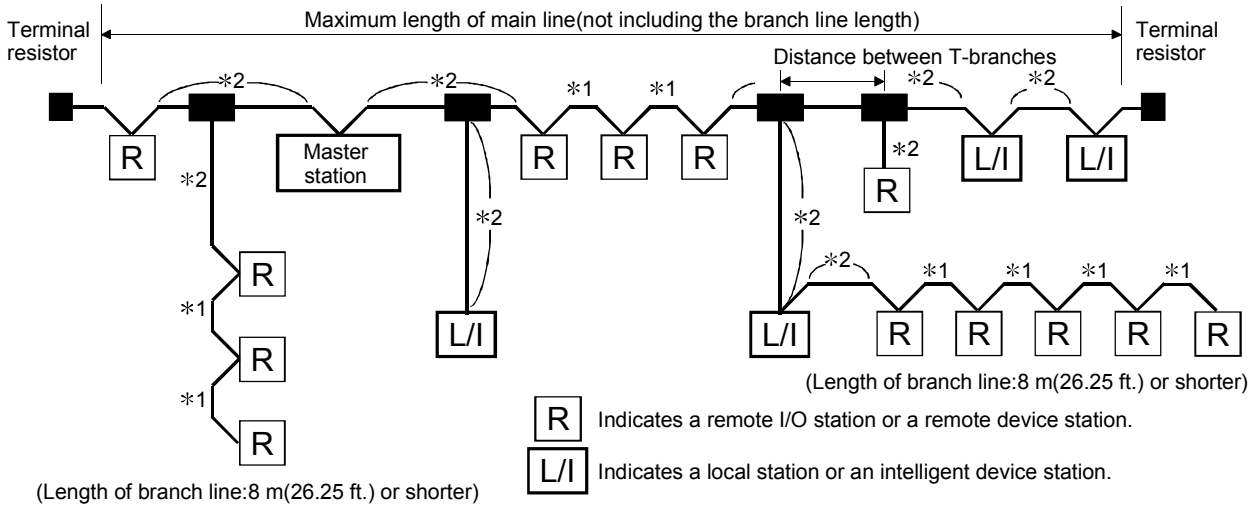
(2) T-Branch communication specifications list

The following explains the communication specifications for T-branch connection. For communication specifications not listed below, refer to Section 3.2 "Performance Specifications."

<table>
<tr><th>Item</th><th colspan="2">Specification</th><th>Remarks</th></tr>
<tr><td>Transmission rate</td><td>625 kbps</td><td>156 kbps</td><td>10 M/5 M/2.5 Mbps are not allowed to use.</td></tr>
<tr><td>Maximum length of the main line</td><td>100 m
(328.1 ft.)</td><td>500 m
(1640.5 ft.)</td><td>Indicates the length of the cable between terminal resistors. The length of the T-branch cable (branch line length) is not included.</td></tr>
<tr><td>Maximum length of the main line</td><td colspan="2">8 m (26.25 ft.)</td><td>Indicates the overall cable length per branch.</td></tr>
<tr><td>Overall branch line length</td><td>50 m (164.05 ft.)</td><td>200 m (656.2 ft.)</td><td>Indicates the overall length of the entire branch cable.</td></tr>
<tr><td>Maximum number of connected stations on the branch line</td><td colspan="2">6 stations per branch</td><td>The total number of connected stations depends on the CC-Link specifications.</td></tr>
<tr><td>Connected cable</td><td colspan="2">CC-Link dedicated cable
Ver 1.10 corresponding CC-Link dedicated cable</td><td>• The CC-Link dedicated high performance cable cannot be used (example: FANC-SBH).
• Mixed use of the CC-Link dedicated cables made by different manufacturers is not allowed.
• Mixed use of the Ver. 1.10 compatible CC-Link dedicated cables made by different manufacturers is not allowed.</td></tr>
<tr><td>Terminal resistor
(connection method)
Only when the I/F board, A(1S)J61BT11 or A(1S)J61QBT11 is used as the master station.
When the QJ61BT11 is used as the master station, connect the 110 Ω resistor that is supplied with the module. For the connection method, refer to Section 5.4.3.</td><td colspan="2">110 Ω ± 5 %, 1/2 W × 4
(Connect between DA and DG/DB and DG)...both ends
[Connection]
 
</td><td>• Use a commercially available terminal resistor of 110 Ω ± 5 %, 1/2 W resistance.
• 110 Ω and 130 Ω resistors that are supplied with the CC-Link Ver.2 board, master/local modules cannot be used.</td></tr>
<tr><td>T-branch terminal block/connector</td><td colspan="2">• Terminal block: Off-the-shelf terminal block
• Connector: Connector NECA4202 for the FA sensor (IEC947-5-2) comparable product is recommended.</td><td>• When wiring cables for the main line side, try not to remove the covering as much as possible.</td></tr>
<tr><td>Maximum length of main line, distance between T-branches, and length of cable between stations.</td><td colspan="3">The CC-Link dedicated cable, Ver. 1.10 compatible CC-Link dedicated cable (terminal resistor of 110 Ω used).
<table>
<tr><th>Transmission rate</th><th>Maximum length of main line</th><th>Distance between T-branches</th><th>Length of cable between the remote I/O stations or remote device stations ＊1</th><th>Length of cable between the master/ local station or intelligent device station and the adjacent station(s) ＊2</th></tr>
<tr><td>625 kbps</td><td>100 m (328.1 ft)</td><td rowspan="2">No limit</td><td rowspan="2">30 cm (11.8 in.) or longer</td><td rowspan="2">1 m (3.28 ft.) or longer (＊1)/
2 m (6.56 ft.) or longer (＊2)</td></tr>
<tr><td>156 kbps</td><td>500 m (1640.5 ft)</td></tr>
</table>
＊1: The cable length of 1 m (3.28 ft.) or longer is for a system configured only with remote I/O stations and remote device stations.
＊2: The cable length of 2 m (6.56 ft.) or longer is for a system configuration that contains local stations and intelligent device stations.
 
</td></tr>
</table>

5.5 Station Number Setting

The following explains how to set the station numbers for the master station, local station, standby master station, remote station and intelligent device station.
For details on the station number settings, refer to Section 8.2.3.

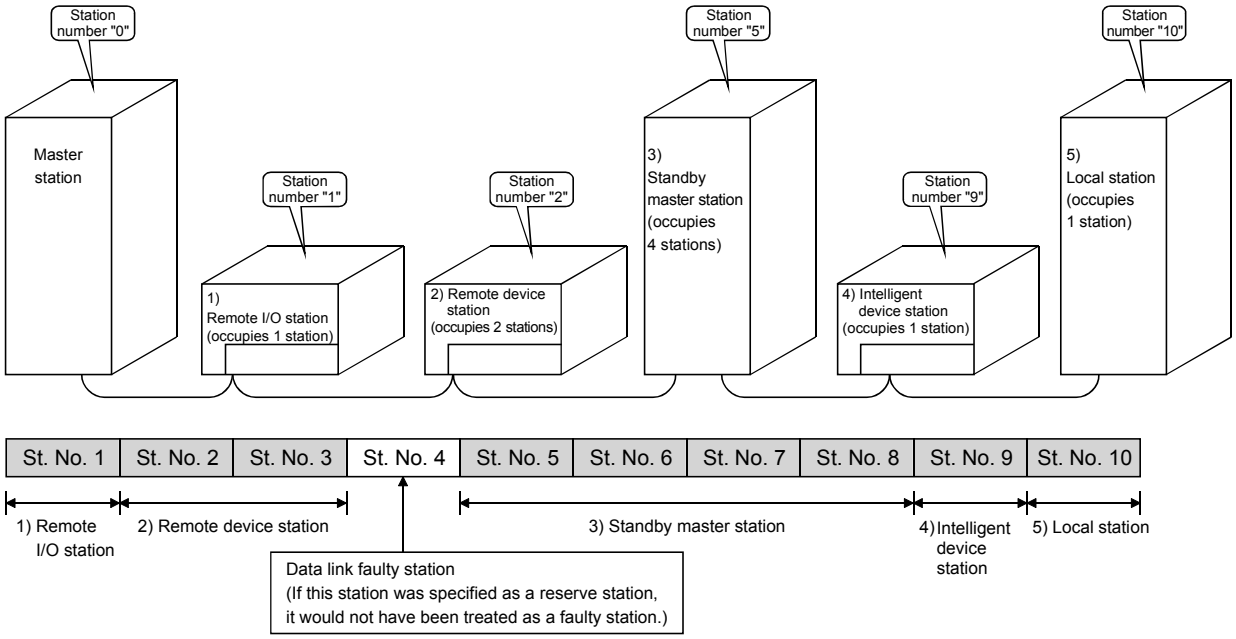
Specify the station numbers according to the following conditions:

(1) Assign sequential station numbers.
Station numbers can be specified regardless of the order in which the stations are connected.
For a module occupying two or more stations, specify the first station number.

(2) Specify unused station numbers as reserved stations.
If unused station numbers are not specified as reserved stations, they will be handled as data link faulty stations (can be checked with special link registers SW0080 to SW0083).

(3) Specify unique station numbers.
If duplicate station numbers are specified, an installation error occurs. (Error codes are stored in SW0069)

[Setting example] One station was skipped when station numbers were specified.


Station number "0"
Master station
Station number "1"
1) Remote I/O station (occupies 1 station)
Station number "2"
2) Remote device station (occupies 2 stations)
Station number "5"
3) Standby master station (occupies 4 stations)
Station number "9"
4) Intelligent device station (occupies 1 station)
Station number "10"
5) Local station (occupies 1 station)
St. No. 1
St. No. 2
St. No. 3
St. No. 4
St. No. 5
St. No. 6
St. No. 7
St. No. 8
St. No. 9
St. No. 10
1) Remote I/O station
2) Remote device station
3) Standby master station
4) Intelligent device station
5) Local station
Data link faulty station
(If this station was specified as a reserve station, it would not have been treated as a faulty station.)

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5.6 Transmission Rate and Mode Settings

The transmission rate and mode settings are specified with the CC-Link Ver.2 Utility.
For details on the transmission rate/mode settings, refer to Section 8.2.5.

The transmission rates that can be set vary depending on the overall distance.
For more details, refer to Section 3.2.

POINT

Use the same transmission rate for the master station, remote stations, local stations, intelligent device stations and standby master station.
If any of the settings for at least one station is different, data link cannot be established normally.

5.7 Test

Check the CC-Link Ver.2 board and the cables.
Select a test item using the mode setting on the "Test" screen in the CC-Link Ver.2 Utility.
The CC-Link Ver.2 board test has the following four types.

Item	Test type	Description
Board confirmation	Hardware test	This test is used to check the hardware operation before configuring the system or to check whether or not the CC-Link Ver.2 board is operating properly when the data link is not performed correctly.
Network confirmation	Line test (Hardware)	For slave stations connected to the master station, this test is used to check whether or not all modules of station No.1 to 64 (All stations) or a specific module (Selected Station) is connected correctly with the CC-Link cable(s) and the data link is enabled. This test is effective when the data link is not available due to an error, for example.
	Line test (Software)	This test is used to check the connection with all modules of station No. 1 to 64 (All stations) or a specific module (Selected station) with parameters set and the data link being performed.
	Network test	This is used to test the start or stop of the data link after connecting CC-Link cables or after establishing the data link.

MEMO

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6 PARAMETER SETTINGS

This chapter explains the parameter settings that are required to perform data link in the CC-Link system.

6.1 Parameter Setting Items

The parameter setting items and their descriptions are shown in Table 6.1.
Each parameter is set using the CC-Link Ver.2 Utility.
Refer to Appendix 8 Parameter Setting Sheet to record the set parameters.
For the CC-Link Ver.2 utility, refer to Section 8.2.

(1) Parameter setting items list

Parameters to be set are listed on the next page (Table 6.1).

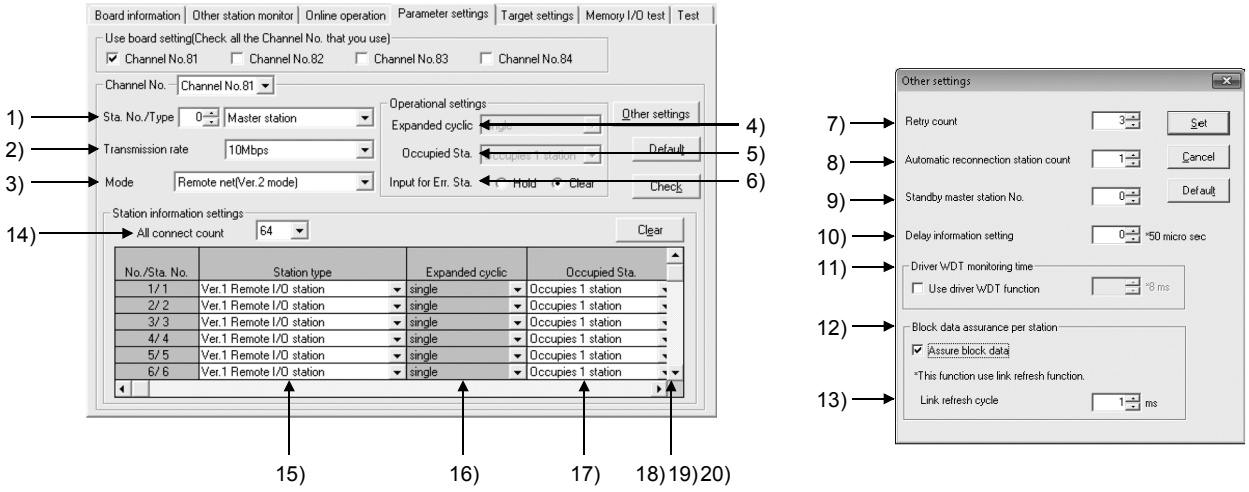

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Table 6.1 Parameter setting items list

○: Setting required ×: Setting not required

Setting item	Description	Master station	Local station Standby master station	Reference section
1) Sta. No./Type	Sets a station No. and a type of the own station. Setting range Sta. No.: 0, 1 to 64 (Default: 1) Type: When Sta. No. is 0:Master station, When Sta. No. is 1 to 64: Local station (Default), Standby master station	○	○	Section 4.3.4
2) Transmission rate	Set the transmission speed of the CC-Link Ver.2 board. Setting item: 156kbps, 625kbps, 2.5Mbps, 5Mbps, 10Mbps (Default)	○	○	—
3) Mode	Set the operation mode of the own station. Setting item: Remote net ver.2 mode Remote net additional mode Remote net ver.1 mode (Default) Offline	○	○	—
Operational settings				
4) Expanded cyclic	Make the expanded cyclic setting when increasing the number of cyclic points. (Can be set in remote net ver.2 mode or remote net additional mode) Setting item: single (Default), double, quadruple, octuple	×	○	Section 4.4.7
5) Occupied Sta.	Set the occupied station count by the own station. Setting item: occupies 1 station (Default), occupies 2 stations, occupies 3 stations, occupies 4 stations	×	○	—
6) Input for Err. Sta.	Set how to handle the input data in the event of a data link error. Setting item: Hold, Clear (Default)	○	○	—
Other settings				
7) Retry count	Set the number of retries to be performed when a communication error occurs. Setting range: 1 to 7 (Default: 3)	○	×	—
8) Automatic reconnection station count	Set the number of slave stations that can be returned to the network within 1 link scan. Setting range: 1 to 10 (Default: 1)	○	×	Section 4.3.2
9) Standby master station No.	Set the station number of the standby master station. Setting range: 0 to 64 (Default: 0)	○	×	Section 4.3.4
10) Delay information setting	Set 0 to "Delay information setting".	○	×	—
11) Driver WDT Monitoring Time	Set the driver WDT monitoring time. (Unit: 8ms) Select "Use driver WDT function" to enable this function. Setting range: 1 to 32767 (Default: No setting) *1	○	○	—
12) Block data assurance per station	Set the block data assurance per station to enable/disable. Select "Assure block data" to enable this function. (Default: Disable)	○	○	Section 4.3.6
13) Link refresh cycle	Set the link refresh cycle. *2 (Unit: ms) Setting range: 1 to 1000 (Default: No setting) *3	○	○	—

*1: When the driver WDT function is enabled, the recommended value 250 will be displayed in the set value of driver WDT monitoring time irrespective of the previous set value.
*2: The link refresh cycle can be set only when block data assurance per station setting is enabled.
*3: When the block data assurance per station is enabled, the recommended value 1 will be displayed in the set value of link refresh cycle irrespective of the previous set value.

○: Setting required ×: Setting not required

Setting item	Description	Master station	Local station Standby master station	Reference section
Station information Settings				
14) All connect count	Set the number of slave stations connected to the master station. (Including reserved stations) Setting range: 1 to 64 (Default: 64)	○	×	—
Station information				
15) Station type ＊1	Set the type of the relevant station. Setting range: Ver.1 remote I/O station (Default) Ver.1 remote device station Ver.1 intelligent device station Ver.2 remote device station Ver.2 intelligent device station	Refer to Table 6.2	×	—
16) Expanded cyclic	Make the expanded cyclic setting of the relevant station. (Can be set in remote net ver.2 mode or remote net additional mode) Setting item: single (Default), double, quadruple, octuple		×	Section 4.4.7
17) Occupied Sta.	Set the number of stations occupied by the relevant station. Setting item: occupies 1 station (Default), occupies 2 stations, occupies 3 stations, occupies 4 stations		×	—
18) Remote station points	Set the points of the relevant station. Setting range: 0 points (Default), 8 points, 8 points+8 points, 16 points, 32 points		×	Section 4.4.6
19) Reserve/ Invalid station select	Specify the reserved station or error invalid station. Setting range: No setting (Default), Reserved station, Invalid station		×	Section 4.4.1 Section 4.4.2
20) Intelligent buffer select (word)	Assign the buffer memory size for transient transmission to the local station, the intelligent device station and the standby master station. Setting range (Per station) Send/receive buffer size: 0, 64 to 4096 (words) (Default: 64) Note that, when it is set to multiple stations, the total send/receive buffer size for all slave stations must be within 4096 (words). Automatic (automatic update) buffer size: 0, 64 to 4096 (words) (Default: 128) Note that, when it is set to multiple stations, the total automatic buffer size for all slave stations must be within 4096 (words).		×	—

＊1: Select the intelligent device station when using the local station.

POINT

When changing parameters and/or settings of the master station or slave station, perform the operation after stopping the data link at the master station.

Table 6.2 Availability of station information setting (only when selecting the master station)

○: Setting required ×: Setting not required

Setting item / Mode setting	Number of connected modules	Station type	Expanded cyclic	Occupied Sta.	Remote station points	Reserve/ invalid station count	Intelligent buffer select (word)
Remote net ver.1 mode	○	No setting	×	○	×	○	×
	○	Remote I/O station	×	○	×	○	×
	○	Remote device station	×	○	×	○	×
	○	Intelligent device station	×	○	×	○	○
Remote net ver.2 mode	○	No setting	×	○	○ *2	○	×
	○	Ver.1 Remote I/O station	×	○	0 points (Reserved station) 8 points 8 points + 8 empty points 16 points 32 points	○	×
	○	Ver.1 Remote device station	×	○	○ *2	○	×
	○	Ver.1 Intelligent device station	×	○	○ *2	○	○
	○	Ver.2 Remote device station	○	○	○ *2	○	×
	○	Ver.2 Intelligent device station	○	○	○ *2	○	○
Remote net additional mode *1	○	No setting	×	○	×	○	×
	○	Ver.1 Remote I/O station	×	○	×	○	×
	○	Ver.1 Remote device station	×	○	×	○	×
	○	Ver.1 Intelligent device station	×	○	×	○	○
	○	Ver.2 Remote device station	○	○	×	○	×
	○	Ver.2 Intelligent device station	○	○	×	○	○

*1: Set smaller station numbers to the remote net ver.1 mode stations and larger station numbers to the remote net ver.2 mode stations.
System configuration with remote net ver.1 mode stations only is available while system configuration with remote net ver.2 mode stations only is not allowed.

*2: The following table shows the remote station points setting options available for the expanded cyclic setting and the occupied station count.

Table 6.3 Remote station points setting options

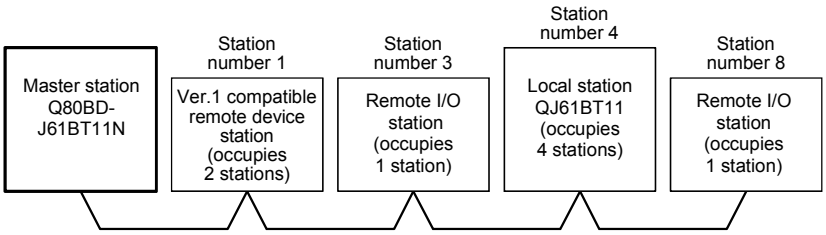
Station type	Expanded cyclic	Occupied station count				
		No setting	Occupies 1 station	Occupies 2 stations	Occupies 3 stations	Occupies 4 stations
No setting Ver.1 remote device Ver.1 intelligent device	Single (fixation)	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)
		32 points	32 points	64 points	96 points	128 points
Ver.2 remote device Ver.2 intelligent device	Single	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)
		32 points	32 points	64 points	96 points	128 points
	Double	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)
		32 points	32 points	96 points	160 points	224 points
	Quadruple	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)
		64 points	64 points	192 points	320 points	448 points
	Octuple	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)	0 points (Reserved station)
		128 points	128 points	384 points	640 points	896 points

6.2 Parameter Setting Examples (Remote Net Ver.1 Mode)

This section explains the parameter settings using the CC-Link Ver.2 utility.

6.2.1 Master station network parameter settings

The descriptions in this section are based on the following system configuration example.
For details of the CC-Link Ver.2 utility, refer to Section 8.2.



Setting item			Setting value
Sta. No.			0
Type			Master station
Transmission rate			10 Mbps
Mode			Remote net [Ver.1 mode]
Operational settings	Expanded cyclic		single
	Occupied Sta.		Occupies 1 station
	Input for Err. Sta.		Clear
	Other settings	Retry count	3 (Times)
		Automatic reconnection station count	1 (Module)
		Standby master station No.	0 (no standby master station designated)
		Delay information setting	0 × 50 micro sec
		Driver WDT Monitoring Time	250 × 8 ms
		Block data assurance per station	Disable
		Link refresh cycle	—
Station information settings	All connect count		4 (Modules)
	Station information		Refer to the Table below.

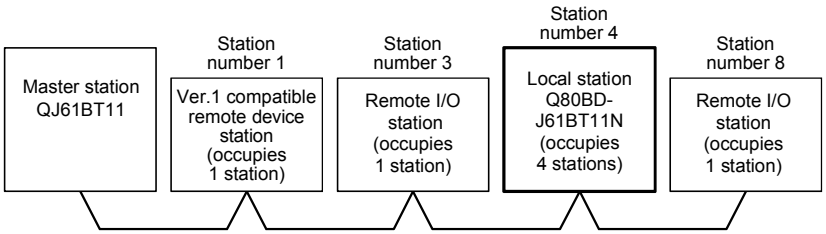
Station information setting items

Setting item		Setting value			
No. / Sta. No.		1/1	2/3	3/4	4/8
Station type		Remote device station	Remote I/O station	Intelligent device station	Remote I/O station
Expanded cyclic		single	single	single	single
Occupied Sta.		Occupies 2 stations	Occupies 1 station	Occupies 4 stations	Occupies 1 station
Remote station points		64 points	32 points	128 points	32 points
Reserve/invalid station select		No setting	No setting	No setting	No setting
Intelligent buffer select (word)	Send	—	—	16	—
	Receive	—	—	—	—
	Automatic	—	—	—	—

: Setting not required

6.2.2 Local station network parameter settings

The descriptions in this section are based on the following system configuration example.
For details of the CC-Link Ver.2 utility, refer to Section 8.2.


Master station
QJ61BT11
Station number 1
Ver.1 compatible remote device station (occupies 1 station)
Station number 3
Remote I/O station (occupies 1 station)
Station number 4
Local station Q80BD-J61BT11N (occupies 4 stations)
Station number 8
Remote I/O station (occupies 1 station)

Setting item			Setting value
Sta. No.			0
Type			Local station
Transmission rate			10 Mbps
Mode			Remote net [Ver.1 mode]
Operational settings	Expanded cyclic		single
	Occupied Sta.		Occupies 4 stations
	Input for Err. Sta.		Clear
	Other settings	Retry count	—
		Automatic reconnection station count	—
		Standby master station No.	—
		Delay information setting	—
		Driver WDT Monitoring Time	250 × 8 ms
		Block data assurance per station	Disable
		Link refresh cycle	—
Station information settings	All connect count		—
	Station information		—

Station information setting items

Setting item		Setting value			
No. / Sta. No.		—	—	—	—
Station type		—	—	—	—
Expanded cyclic		—	—	—	—
Occupied Sta.		—	—	—	—
Remote station points		—	—	—	—
Reserve/invalid station select		—	—	—	—
Intelligent buffer select (word)	Send	—	—	—	—
	Receive	—	—	—	—
	Automatic	—	—	—	—

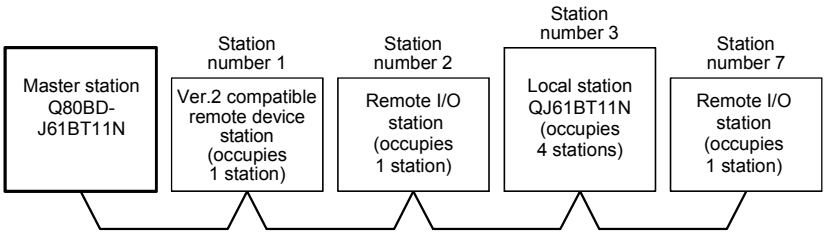
: Setting not required

6.3 Parameter Setting Examples (Remote Net Ver.2 Mode)

This section explains the parameter settings using the CC-Link Ver.2 utility.

6.3.1 Master station network parameter settings

The descriptions in this section are based on the following system configuration example.
For details of the CC-Link Ver.2 utility, refer to Section 8.2.



Setting item			Setting value
Sta. No.			0
Type			Master station
Transmission rate			10 Mbps
Mode			Remote net [Ver.2 mode]
Operational settings	Expanded cyclic		single
	Occupied Sta.		Occupies 1 station
	Input for Err. Sta.		Clear
	Other settings	Retry count	3 (Times)
		Automatic reconnection station count	1 (Module)
		Standby master station No.	0 (no standby master station designated)
		Delay information setting	0 × 50 micro sec
		Driver WDT Monitoring Time	250 × 8 ms
		Block data assurance per station	Disable
		Link refresh cycle	—
Station information settings	All connect count		4 (Modules)
	Station information		Refer to the Table below.

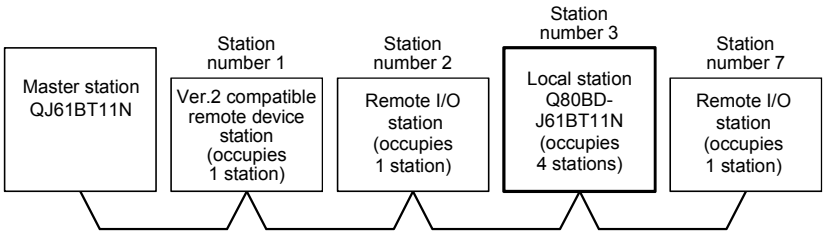
Station information setting items

Setting item		Setting value			
No. / Sta. No.		1/1	2/2	3/3	4/7
Station type		Ver.2 Remote device station	Ver.1 Remote I/O station	Ver.2 Intelligent device station	Ver.1 Remote I/O station
Expanded cyclic		octuple	single	double	single
Occupied Sta.		Occupies 1 station	Occupies 1 station	Occupies 4 stations	Occupies 1 station
Remote station points		128 points	32 points	224 points	32 points
Reserve/invalid station select		No setting	No setting	No setting	No setting
Intelligent buffer select (word)	Send	—	—	32	—
	Receive	—	—	—	—
	Automatic	—	—	—	—

: Setting not required

6.3.2 Local station network parameter settings

The descriptions in this section are based on the following system configuration example.
For details of the CC-Link Ver.2 utility, refer to Section 8.2.


Master station
QJ61BT11N
Station number 1
Ver.2 compatible remote device station (occupies 1 station)
Station number 2
Remote I/O station (occupies 1 station)
Station number 3
Local station Q80BD-J61BT11N (occupies 4 stations)
Station number 7
Remote I/O station (occupies 1 station)

Setting item			Setting value
Sta. No.			3
Type			Local station
Transmission rate			10 Mbps
Mode			Remote net [Ver.2 mode]
Operational settings	Expanded cyclic		double
	Occupied Sta.		Occupies 4 stations
	Input for Err. Sta.		Clear
	Other settings	Retry count	—
		Automatic reconnection station count	—
		Standby master station No.	—
		Delay information setting	—
		Driver WDT Monitoring Time	250 × 8 ms
		Block data assurance per station	Disable
		Link refresh cycle	—
Station information settings	All connect count		—
	Station information		—

Station information setting items

Setting item		Setting value			
No. / Sta. No.		—	—	—	—
Station type		—	—	—	—
Expanded cyclic		—	—	—	—
Occupied Sta.		—	—	—	—
Remote station points		—	—	—	—
Reserve/invalid station select		—	—	—	—
Intelligent buffer select (word)	Send	—	—	—	—
	Receive	—	—	—	—
	Automatic	—	—	—	—

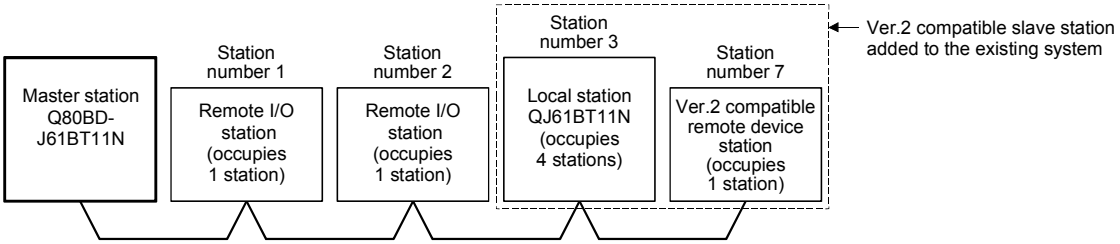
: Setting not required

6.4 Parameter Setting Examples (Remote Net Additional Mode)

This section explains the parameter settings using the CC-Link Ver.2 utility.

6.4.1 Master station network parameter settings

The descriptions in this section are based on the following system configuration example.
For details of the CC-Link Ver.2 utility, refer to Section 8.2.



Setting item			Setting value
Sta. No.			0
Type			Master station
Transmission rate			10 Mbps
Mode			Remote net [Additional mode]
Operational settings	Expanded cyclic		single
	Occupied Sta.		Occupies 1 station
	Input for Err. Sta.		Clear
	Other settings	Retry count	3 (Times)
		Automatic reconnection station count	1 (Module)
		Standby master station No.	0 (no standby master station designated)
		Delay information setting	0 × 50 micro sec
		Driver WDT Monitoring Time	250 × 8 ms
		Block data assurance per station	Disable
		Link refresh cycle	—
Station information settings	All connect count		4 (Modules)
	Station information		Refer to the Table below.

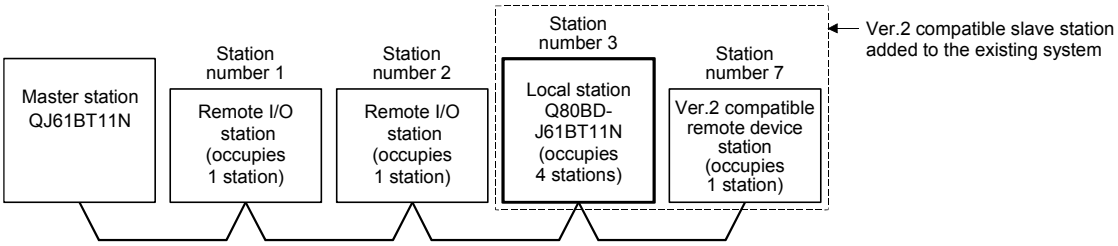
Station information setting items

Setting item		Setting value			
No. / Sta. No.		1/1	2/3	3/4	4/8
Station type		Ver.1 Remote I/O station	Ver.1 Remote I/O station	Ver.2 Intelligent device station	Ver.2 Remote device station
Expanded cyclic		single	single	double	octuple
Occupied Sta.		Occupies 1 station	Occupies 1 station	Occupies 4 stations	Occupies 1 station
Remote station points		32 points	32 points	224 points	128 points
Reserve/invalid station select		No setting	No setting	No setting	No setting
Intelligent buffer select (word)	Send	—	—	32	—
	Receive	—	—	—	—
	Automatic	—	—	—	—

: Setting not required

6.4.2 Local station network parameter settings

The descriptions in this section are based on the following system configuration example.
For details of the CC-Link Ver.2 utility, refer to Section 8.2.


Master station
QJ61BT11N
Station number 1
Remote I/O station (occupies 1 station)
Station number 2
Remote I/O station (occupies 1 station)
Station number 3
Local station Q80BD-J61BT11N (occupies 4 stations)
Station number 7
Ver.2 compatible remote device station (occupies 1 station)
Ver.2 compatible slave station added to the existing system

Setting item			Setting value
Sta. No.			3
Type			Local station
Transmission rate			10 Mbps
Mode			Remote net [Additional mode]
Operational settings	Expanded cyclic		double
	Occupied Sta.		Occupies 4 stations
	Input for Err. Sta.		Clear
	Other settings	Retry count	—
		Automatic reconnection station count	—
		Standby master station No.	—
		Delay information setting	—
		Driver WDT Monitoring Time	250 × 8 ms
		Block data assurance per station	Disable
		Link refresh cycle	—
Station information settings	All connect count		—
	Station information		—

Station information setting items

Setting item		Setting value			
No. / Sta. No.		—	—	—	—
Station type		—	—	—	—
Expanded cyclic		—	—	—	—
Occupied Sta.		—	—	—	—
Remote station points		—	—	—	—
Reserve/invalid station select		—	—	—	—
Intelligent buffer select (word)	Send	—	—	—	—
	Receive	—	—	—	—
	Automatic	—	—	—	—

: Setting not required

6.5 Status Difference Between a Master Station and a Slave Station at an Error

The status at an error occurrence differs depending on the settings of "Input for Err. Sta" in "Operational settings" of Parameter.
When configuring the settings, consider the station status at errors listed below.

(1) Status of a master station and remote I/O station

The following table shows the status of the master station and remote I/O stations when an error occurred.

Data link status			Master station				Remote I/O station	
			Remote input (RX)	Remote output (RY)	Remote register (RWw)	Remote register (RWr)	Input	Output
When the local station's programmable controller CPU is stopped (data link continues)			All points are set to off for only the receive area from the stopped local station ＊1	Continue	Continue	Continue	Continue	Continue
When data link for the entire system is stopped	"Input for Err. Sta." of the CC-Link Ver.2 utility (for master station setting)	Clear	Clear	—	—	Latch	—	All points off
		Hold	Latch					
When a communication error (power off, etc.) occurs in a remote I/O station	"Input for Err. Sta." of the CC-Link Ver.2 utility (for master station setting)	Clear	Clears the receive area from the remote I/O station having a communication error	Continue	Continue	Continue	—	All points off
		Hold	Retains the receive area from the remote I/O station having a communication error					
When a communication error (power off, etc.) occurs in a remote device station	"Input for Err. Sta." of the CC-Link Ver.2 utility (for master station setting)	Clear	Clears the receive area from the remote device station having a communication error	Continue	Continue	Retains the receive area from the remote device station having a communication error	Continue	Continue
		Hold	Retains the receive area from the remote device station having a communication error					
When a communication error (power off, etc.) occurs in a local station	"Input for Err. Sta." of the CC-Link Ver.2 utility (for master station setting)	Clear	Clears the receive area from the local station having a communication error	Continue	Continue	Retains the receive area from the local station having a communication error	Continue	Continue
		Hold	Retains the receive area from the local station having a communication error					

＊1: This is because Yn0 (refresh direction) is turned off.

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(2) Status of the remote device station, local station, standby master station and intelligent device station

The following table shows the status of the remote device stations, local stations, standby master stations, and intelligent device stations when an error occurred.

<table>
<tr><th colspan="4" rowspan="2">Data link status</th><th colspan="4">Remote device station,
Intelligent device station</th><th colspan="4">Local station, standby master station</th></tr>
<tr><th>Remote input (RX)</th><th>Remote output (RY)</th><th>Remote register (RWw)</th><th>Remote register (RWr)</th><th>Remote input (RX)</th><th>Remote output (RY)</th><th>Remote register (RWw)</th><th>Remote register (RWr)</th></tr>
<tr><td colspan="4">When the local station's programmable controller CPU is stopped
(data link continues)</td><td>Continue</td><td>Continue</td><td>Continue</td><td>Continue</td><td>Continue</td><td>Treats the own station send area with all 0's. ＊1
When stopped, all points of only the receive area from the local station are set to off.</td><td>Continue</td><td>Continue</td></tr>
<tr><td rowspan="2">When data link for the entire system is stopped</td><td rowspan="2">"Input for Err. Sta." of the CC-Link Ver.2 utility
(for local station setting)</td><td>Clear</td><td rowspan="2">—</td><td rowspan="2">All points off</td><td rowspan="2">—</td><td rowspan="2">—</td><td>Clear</td><td>Clears the receive areas from other stations</td><td rowspan="2">Retains the receive areas from other stations</td><td rowspan="2">Latch</td></tr>
<tr><td>Hold</td><td>Latch</td><td>Retains the receive areas from other stations</td></tr>
<tr><td rowspan="2">When a communication error (power off, etc.) occurs in a remote I/O station</td><td rowspan="2">"Input for Err. Sta." of the CC-Link Ver.2 utility
(for local station setting)</td><td>Clear</td><td rowspan="2">Continue</td><td rowspan="2">Continue</td><td rowspan="2">Continue</td><td rowspan="2">Continue</td><td rowspan="2">Continue</td><td>Clears the receive area from the remote I/O station having a communication error</td><td rowspan="2">Continue</td><td rowspan="2">Continue</td></tr>
<tr><td>Hold</td><td>Retains the receive area from the remote I/O station having a communication error</td></tr>
<tr><td rowspan="2">When a communication error (power off, etc.) occurs in a remote device station</td><td rowspan="2">"Input for Err. Sta." of the CC-Link Ver.2 utility
(for local station setting)</td><td>Clear</td><td rowspan="2">—</td><td rowspan="2">—</td><td rowspan="2">—</td><td rowspan="2">—</td><td rowspan="2">Continue</td><td>Clears the receive area from the remote device station having a communication error</td><td rowspan="2">Retains the receive area from the remote device station having a communication error</td><td rowspan="2">Continue</td></tr>
<tr><td>Hold</td><td>Retains the receive area from the remote device station having a communication error</td></tr>
<tr><td rowspan="2">When a communication error (power off, etc.) occurs in a local station</td><td rowspan="2">"Input for Err. Sta." of the CC-Link Ver.2 utility
(for local station setting)</td><td>Clear</td><td rowspan="2">Continue</td><td rowspan="2">Continue</td><td rowspan="2">Continue</td><td rowspan="2">Continue</td><td rowspan="2">Continue</td><td>Clears the receive area from the local station having a communication error</td><td rowspan="2">Retains the receive area from the local station having a communication error</td><td rowspan="2">Continue</td></tr>
<tr><td>Hold</td><td>Retains the receive area from the local station having a communication error</td></tr>
</table>

＊1: This is because Yn0 (refresh direction) is turned off.

7 INSTALLING AND UNINSTALLING THE SOFTWARE PACKAGE

This chapter explains how to install and uninstall the software package.

7.1 Installation and Uninstallation Precautions

The following are the precautions when installing and uninstalling the software package.

- Log on as a user having administrator authority.
- Make sure to close other applications running on Windows® (including resident software such as antivirus software) before installation and uninstallation.
- The installer may not work normally because the update program of operating system or other companies' software such as Windows Update® and Java update may start automatically. Please install the driver after changing the setting of the update program not to start automatically.
- Check if the display settings on the [Device Manager] or other relevant functions are correct, and install an appropriate display driver.
  Or update the Windows® operating system.
- The language switching function of the operation system set by "Regional and Language Options" on the Control Panel screen is not supported. The installation or uninstallation may not work normally if the language setting is changed.
- Install SW1DNC-CCBD2-B after uninstalling SWnDNF-CCLINK.
- When using Windows Server® 2012, Windows Server® 2012 R2, Windows 8® , or Windows 8.1® , .NET Framework 3.5 is required.
  Enable the .NET Framework 3.5 (including .NET 2.0 or 3.0) in "Turn Windows features on or off" on the control panel.
- A network drive cannot be specified as the installation destination.
- When the parameters have been set with the utility installed, the parameters are initialized at installation. Save the parameters with the save file function before installing the utility.
- When the software package has been installed in the environment that the creation of 8.3 filename is disabled, the software package may not be uninstalled. Enable the creation of 8.3 filename before installing the software package. For the method on how to check and change the status of 8.3 filename creation to enable/disable, refer to the website of Microsoft Corporation.
- When using SW1DNC-CCBD2-B Version 1.17 T or later, apply Service Pack1 and Windows security update program KB3033929 in Windows® 7 and Windows Server® 2008 R2.

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7.2 Installation

This section explains a procedure for installing software package.

(1) Installation

1) Insert the CD-ROM to the CD-ROM drive.
2) Double click the "Setup.exe" file on the CD-ROM.
3) By following the on-screen instructions, select or enter the necessary information. (When the instruction displayed on the screen is not effective, refer to 16.2.3)
4) Restart the personal computer.

(2) When installation is completed normally

When the installation is completed normally, the following utilities are registered.

(a) Utility

When the installation is completed normally, the utilities shown below are registered in the "Start" *1 of Windows® .

*1: [Start screen] - [All apps] or [Start] - [All Programs]

Folder	Utility name	Description
[MELSEC]	CC-Link Ver.2 Utility *2	Utility to setting board and displaying status.
	Device Monitor Utility *3	Utility to monitoring devices and changing the device value.

*2: "MELSEC CC-Link Ver.2 Utility (Board)" is displayed as the icon name when using SW1DNC-CCBD2 Version 1.15R or later.

*3: "Device Monitor Utility (Board)" is displayed as the icon name when using SW1DNC-CCBD2 Version 1.15R or later.

(b) MELSEC Data Link Library

MELSEC data link library is used for the following software packages in common.
When the utilities are installed on the same personal computer, the newer MELSEC data link library of the software package is enabled.
When the installation is completed normally, the manual of MELSEC data link library is registered in the [MELSEC] folder as the same folder as the utility.

POINT

- In order to view the manuals, Adobe Reader is required.
  Adobe Reader can be downloaded from the Adobe Systems Incorporated web site.
- When using 64-bit version operating system, the icon may not be displayed even when Adobe Reader is installed.

Software package	Version	Manual name [*1]
SW0DNC-MNETH-B	22Y or earlier	MELSEC Data Link Function HELP
	23Z or later	MELSEC Data Link Library Reference Manual [*2]
SW1DNC-CCBD2-B	1.10L or earlier	MELSEC Data Link Function HELP
	1.11M or later	MELSEC Data Link Library Reference Manual [*3]
SW1DNC-MNETG-B	1.11M or earlier	MELSEC Data Link Function HELP
	1.12N or later	MELSEC Data Link Library Reference Manual [*4]
SW1DNC-CCIEF-B	1.00A	MELSEC Data Link Library Programmer's Reference
	1.02C or later	MELSEC Data Link Library Reference Manual [*5] [*6]

*1: Depending on other installed software packages, the manuals shown above may also be displayed. In this case, refer to "MELSEC Data Link Library Reference Manual".

*2: "MELSEC Data Link Library Reference Manual (Board)" is displayed as the icon name when using SW0DNC-MNETH-B Version 27D or later.

*3: "MELSEC Data Link Library Reference Manual (Board)" is displayed as the icon name when using SW1DNC-CCBD2 Version 1.15R or later.

*4: "MELSEC Data Link Library Reference Manual (Board)" is displayed as the icon name when using SW1DNC-MNETG-B Version 1.17T or later.

*5: "MELSEC Data Link Library Reference Manual (Board)" is displayed as the icon name when using SW1DNC-CCIEF-B Version 1.06G or later.

*6: When SW1DNC-CCIEF-B Version 1.02C or later is installed, MELSEC Data Link Library Programmer's Reference is deleted.

(c) Driver

When installing the board on the personal computer after the installation of the software package, the driver is installed automatically [*1].

*1: For Windows XP® and Windows Server ® 2003 R2, the driver is required to be specified on the "Found New Hardware Wizard" screen. Refer to 16.2.4.

When the driver installation is completed normally, the following driver is displayed on the Device Manager screen of Windows® .

Device	Driver
MELSEC CC-Link Device	PCI MELSEC CC-Link Ver.2 Controller

(d) Service application

To prevent a personal computer entering the power save mode (hibernate, sleep), MELSECPowerManager is installed automatically under the specific operating system.

For details of MELSECPowerManager , refer to Appendix 17.

(3) When installation is aborted or failed

When the installation is aborted or failed, take corrective actions following the troubleshooting. (Refer to Section 16.2.1)

7.3 Uninstallation

This section explains a procedure for uninstalling the software package.

(1) Uninstallation procedure

Uninstall the software package from the control panel of Windows® .

POINT

- If the dialog box confirming the deletion of common files appears at uninstallation, make the setting to keep all common files.
  If deleting common files, other applications may not operate normally.
- MELSECPowerManager may not be uninstalled depending on the installation state which affects the other installed software packages.
  For details of MELSECPowerManager, refer to Appendix 17.

(2) When uninstallation is completed normally

When the uninstallation is completed normally, the icons registered in the Windows® Start are deleted.

(3) When uninstallation is failed

When the installation is aborted or failed, take corrective actions following the troubleshooting. (Refer to Section 16.2.2)

8 OPERATING THE UTILITY SOFTWARE

8.1 Starting and Ending Utility

This section explains the operating method to start/end the utility.

8.1.1 Starting a utility

Start the utility by clicking the icon registered in the "Start" *1 of Windows® .

*1: [Start screen] - [All apps] or [Start] - [All Programs]

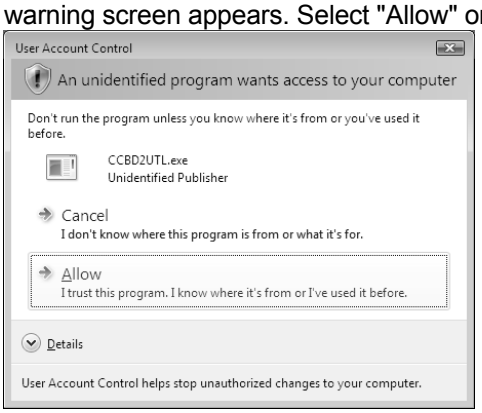
Folder	Utility name	Description	Reference
[MELSEC]	CC-Link Ver.2 Utility *2	Utility to setting board and displaying status.	Section 8.2
	Device Monitor Utility *3	Utility to monitoring devices and changing the device value.	Section 8.3

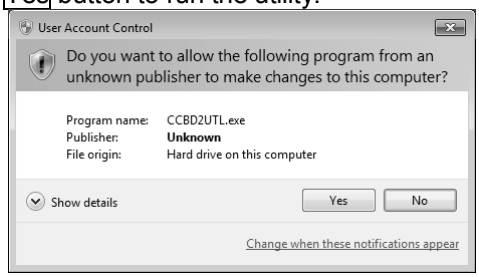
*2: "MELSEC CC-Link Ver.2 Utility (Board)" is displayed as the icon name when using SW1DNC-CCBD2 Version 1.15R or later.

*3: "Device Monitor Utility (Board)" is displayed as the icon name when using SW1DNC-CCBD2 Version 1.15R or later.

POINT

When a utility is run while user account control (UAC) is available, the following warning screen appears. Select "Allow" or Yes button to run the utility.


User Account Control
An unidentified program wants access to your computer
Don't run the program unless you know where it's from or you've used it before.
CCBD2UTL.exe
Unidentified Publisher
Cancel
I don't know where this program is from or what it's for.
Allow
I trust this program. I know where it's from or I've used it before.
Details
User Account Control helps stop unauthorized changes to your computer.


User Account Control
Do you want to allow the following program from an unknown publisher to make changes to this computer?
Program name: CCBD2UTL.exe
Publisher: Unknown
File origin: Hard drive on this computer
Show details
Yes
No
Change when these notifications appear

For details on how to prevent this screen from being displayed, refer to Appendix 15.

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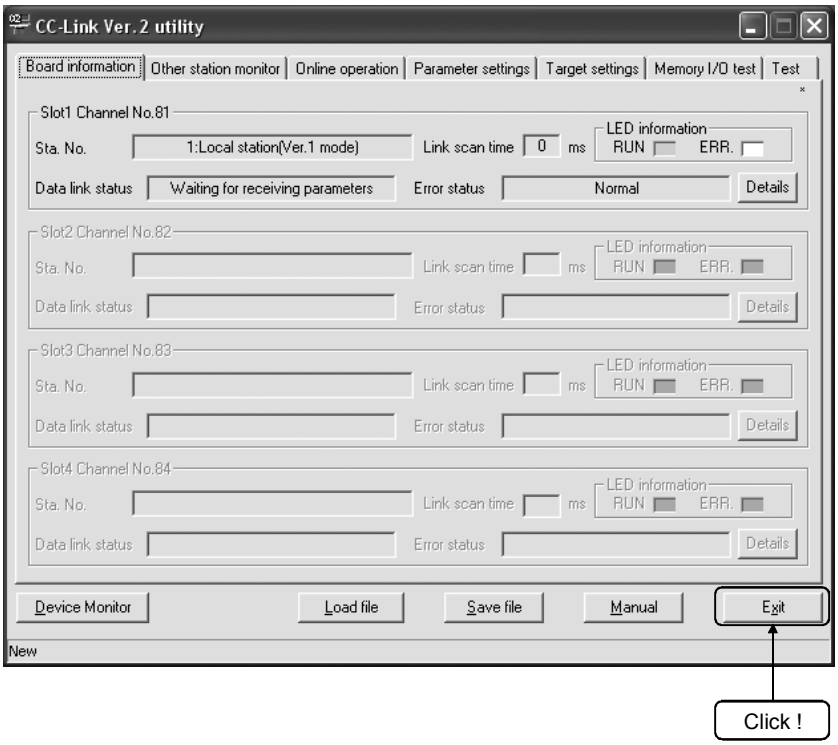
8.1.2 Quitting a utility

The following explains how to exit each utility.

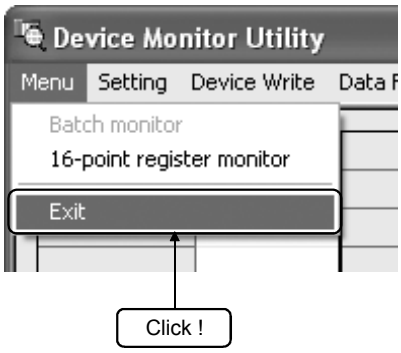
(1) Exiting CC-Link Ver.2 Utility

To exit the utility, click the Exit button at the bottom of the utility screen.



(2) Exiting the Device Monitor Utility

To quite the Device Monitor Utility, click [Menu] - [Exit] on the menu bar. When a dialog box is displayed, click the Yes button to quite the Device Monitor Utility.

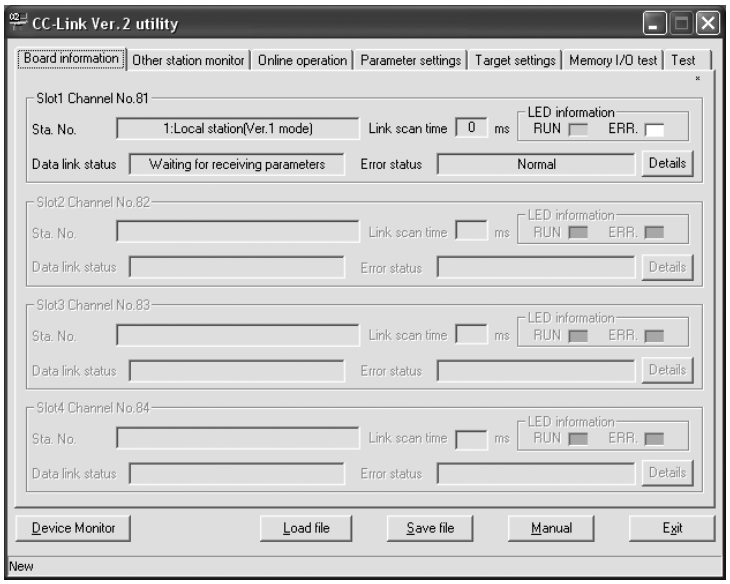


8.2 CC-Link Ver.2 Utility

This section explains how to operate the CC-Link Ver.2 Utility.

8.2.1 Screen configuration and basic operations

The following explains the screen configuration displayed at starting the CC-Link Ver.2 utility.



Item		Description	Reference
Tab	Board information	Displays the various information (station No., transmission rate, data link status, etc.) of the CC-Link Ver.2 board.	Section 8.2.2
	Other station monitor	Displays the status of other stations currently connected to the CC-Link system.	Section 8.2.3
	Online operation	Performs read, write and verification of parameters on the CC-Link Ver.2 board.	Section 8.2.4
	Parameter settings	Sets the parameters of the CC-Link Ver.2 board.	Section 8.2.5
	Target settings	Performs setups for accessing a multiple CPU system.	Section 8.2.6
	Memory I/O Test	Diagnoses the CC-Link Ver.2 board memory.	Section 8.2.7
	Test	Tests the installed CC-Link Ver.2 board.	Section 8.2.8
Device Monitor button		Starts the Device monitor utility.	—
Load file button		Reads out saved parameters. *1	—
Save file button		Writes preset parameters into a file.	—
Manual button		Displays this manual. *2	—
Exit button		Ends the utility.	—

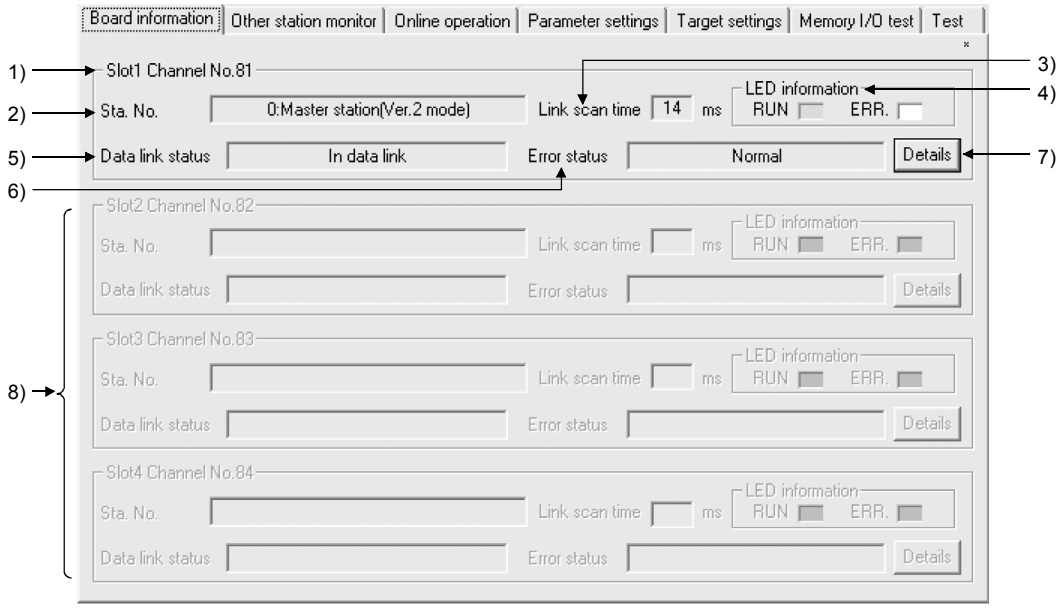
*1: The files which were created in Version 1.17T or later cannot be read in Version 1.16S or earlier.

*2: Adobe Reader is required. Adobe Reader can be downloaded from the Adobe Systems Incorporated web site.

8.2.2 Operating the Board information screen

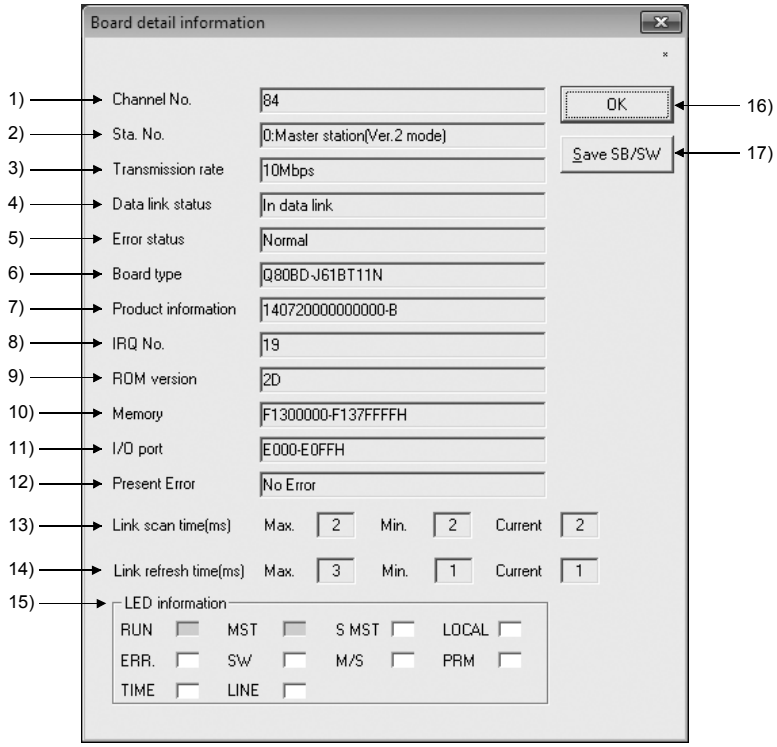
This screen displays the various information of the CC-Link Ver.2 board currently mounted on the PC.

(1) Board information screen



Item		Description
1) Slot1 board		Displays the information of the Slot1 CC-Link Ver.2 board.
	2) Sta. No.	Displays the station No., station type and operation mode of the CC-Link Ver.2 board. (Example) 0 : Master station (Ver.2 mode) Station No. / Station type / Operation mode
	3) Link scan time	Displays the current link scan time.
	4) LED information	Displays the ON/OFF status of the LEDs.
	5) Data link status	Displays the data link status in the CC-Link system.
	6) Error status	Displays the status of the currently detected error.
	7) [Details] button	Displays the Board detail information screen where the details of the CC-Link Ver.2 board can be verified. For more information about the Board detail information screen, refer to "(2) Board detail information screen."
8) Slot2 to Slot4 board		Displays the information of the Slot2 to Slot4 CC-Link Ver.2 boards. For the display details, refer to the "Slot1 board" above.

(2) Board detail information screen



Item	Description
1) Channel No.	Displays the channel number.
2) Sta. No.	Displays the station No., station type and operation mode.
3) Transmission rate	Displays the transmission rate.
4) Data link status	Displays the data link status in the CC-Link system.

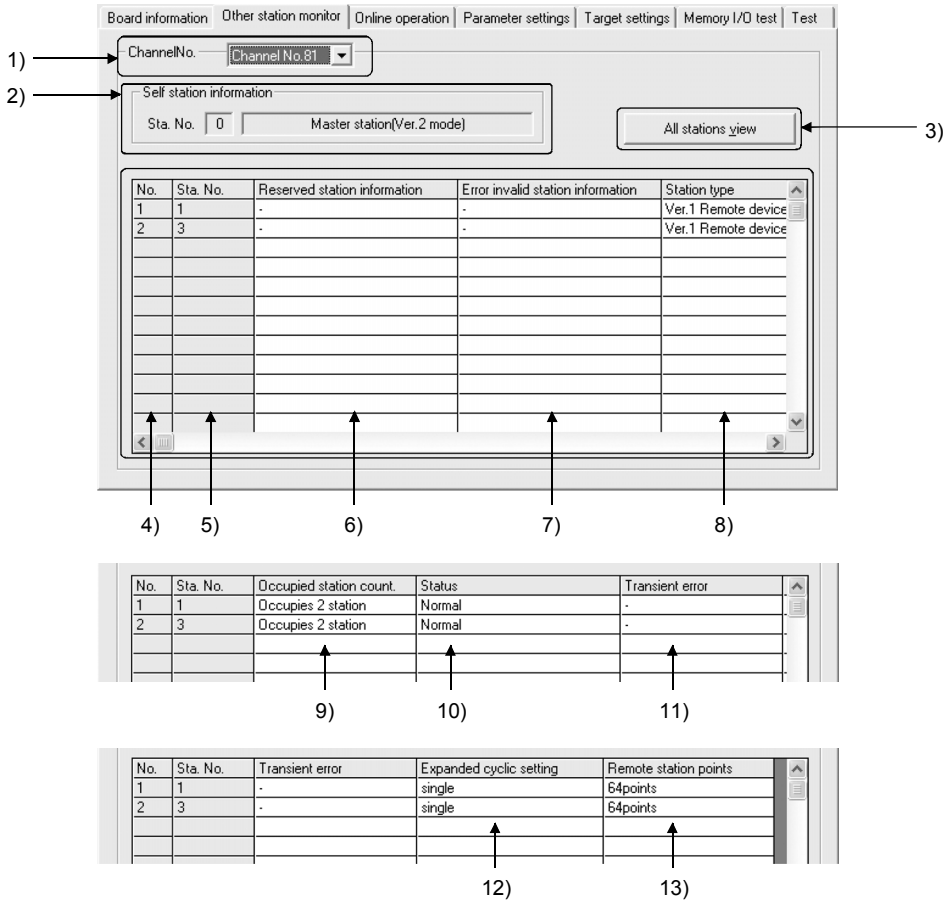
Status	Description
In data link	Data link is being executed.
Suspend data link	Data link has stopped.
Initial status	Data link is in the initial status.
Waiting for receiving parameters	Parameters have not been received yet.
Disconnecting (no request polling)	There is no polling from the master station, and the data link is in the cut-off status.
Disconnecting (link error)	Data link is in the cut-off status due to a line error.
Disconnecting (other)	Data link is in the cut-off status due to any other reason.
During line test	The line test is being conducted.
During parameter setting test	The parameter setting test is being performed from the master station.
During Auto-Returning	The disconnected station is being returned to the network automatically.
During reset	The CC-Link Ver.2 board is being reset.

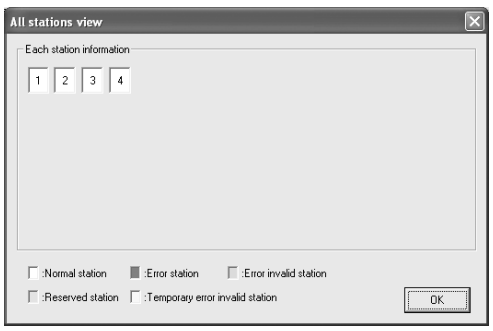
<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>5) Error status</td><td>Displays the status of the error currently detected.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>Normal</td><td>Normal status</td></tr>
<tr><td>Transport error</td><td>An error was detected in the transmission path.</td></tr>
<tr><td>Parameter error</td><td>A parameter error was detected.</td></tr>
<tr><td>CRC error</td><td>An error in the received data was detected.</td></tr>
<tr><td>Timeout error</td><td>A timeout error was detected in data reception.</td></tr>
<tr><td>Abort error</td><td>An error was detected in data communications.</td></tr>
<tr><td>Setting error</td><td>An error was detected in the station No./station type setting, the transmission rate setting or the mode setting.</td></tr>
<tr><td>Illegal</td><td>An error arising from some other cause was detected.</td></tr>
</table></td></tr>
<tr><td>6) Board type</td><td>Displays the model name of the CC-Link Ver.2 board.</td></tr>
<tr><td>7) Product information</td><td>Displays the product information (serial No., function version).</td></tr>
<tr><td>8) IRQ No.</td><td>Displays the IRQ No.</td></tr>
<tr><td>9) ROM version</td><td>Displays the ROM version.</td></tr>
<tr><td>10) Memory</td><td>Displays the 2-port memory.</td></tr>
<tr><td>11) I/O port</td><td>Displays the I/O ports.</td></tr>
<tr><td>12) Present Error</td><td>An error code of the error currently identified on the CC-Link Ver.2 board is indicated in hexadecimal notation.
When no error is currently detected, "No Error" is displayed.</td></tr>
<tr><td>13) Link scan time (ms)</td><td>Displays the maximum, minimum and current link scan times.</td></tr>
<tr><td>14) Link refresh time (ms)</td><td>Displays the maximum, current and minimum link refresh time of the CC-Link Ver.2 board.
"Block data assurance per Station" indicates "0" when disabled.</td></tr>
<tr><td>15) LED information</td><td>Displays the following LED states.
<table>
<tr><th>LED</th><th>Color</th><th>ON</th><th>OFF</th><th>Flashing</th></tr>
<tr><td>RUN</td><td>Green</td><td>Operating normally.</td><td>A WDT error has occurred, or the board is being reset.</td><td></td></tr>
<tr><td>ERR.</td><td>Red</td><td>All stations are faulty.</td><td>No communication error has occurred, or the board is being reset.</td><td>There is a faulty station or station No. is duplicated.</td></tr>
<tr><td>TIME</td><td>Red</td><td>Due to cable disconnection or noise affecting the transmission path, no responses are received from all stations.</td><td>Responses received from all stations</td><td></td></tr>
<tr><td>MST</td><td>Green</td><td>Operating as the master station</td><td>Operating as other than the master station</td><td></td></tr>
<tr><td>SW</td><td>Red</td><td>Switch setting error</td><td>No switch setting error</td><td></td></tr>
<tr><td>LINE</td><td>Red</td><td>Cable disconnection error</td><td>No cable disconnection error</td><td></td></tr>
<tr><td>S MST</td><td>Green</td><td>Operating as a standby master station</td><td>Operating as other than the standby master station</td><td></td></tr>
<tr><td>M/S</td><td>Red</td><td>Station duplicated error</td><td>Station not duplicated</td><td></td></tr>
<tr><td>LOCAL</td><td>Green</td><td>Operating as a local station</td><td>Operating as other than the local station</td><td></td></tr>
<tr><td>PRM</td><td>Red</td><td>Parameter error</td><td>No parameter error</td><td></td></tr>
</table></td></tr>
<tr><td>16) [OK] button</td><td>Closes the Board detail information screen.</td></tr>
<tr><td>17) [Save SB/SW] button</td><td>Saves the information of all the CC-Link Ver.2 board SB/SW areas selected on this screen in CSV format.</td></tr>
</table>

8.2.3 Operating the Other station monitor screen

This screen shows the line status of other stations (all stations) that are currently connected to the CC-Link system.

Other station monitor screen

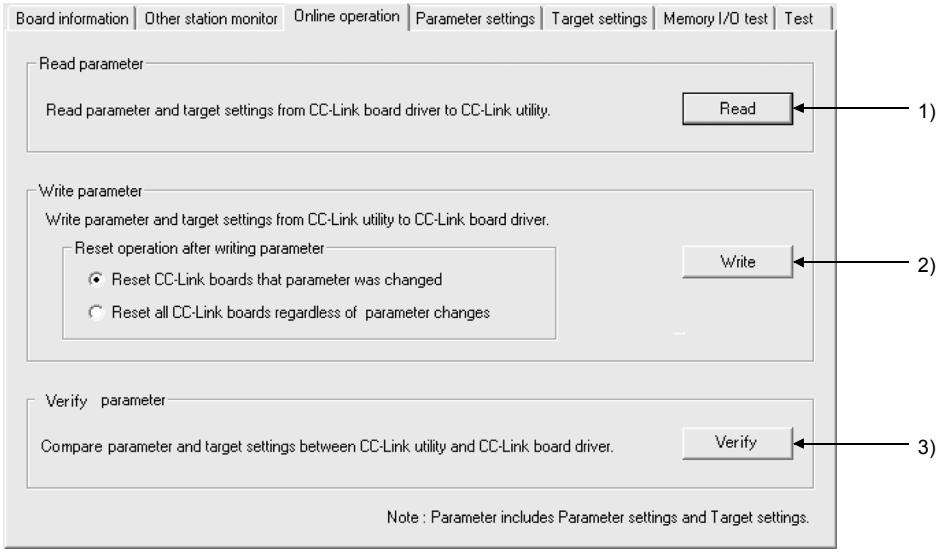

Board information
Other station monitor
Online operation
Parameter settings
Target settings
Memory I/O test
Test
1)
ChannelNo.
Channel No.81
2)
Self station information
Sta. No. 0
Master station(Ver.2 mode)
All stations view
3)
No. Sta. No. Reserved station information Error invalid station information Station type
1 1 - - Ver.1 Remote device
2 3 - - Ver.1 Remote device
4) 5) 6) 7) 8)
No. Sta. No. Occupied station count. Status Transient error
1 1 Occupies 2 station Normal -
2 3 Occupies 2 station Normal -
9) 10) 11)
No. Sta. No. Transient error Expanded cyclic setting Remote station points
1 1 - single 64points
2 3 - single 64points
12) 13)

Item	Description
1) Channel No.	Select the target CC-Link Ver.2 board to be monitored.
2) Self station information	Displays the station No., station type, and operation mode of the selected CC-Link Ver.2 board.
3) All stations view button	Displays the communications states of other stations. 

<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td rowspan="13">(Information of other stations)</td><td>4) No.</td><td>Displays the number of modules currently connected to the CC-Link system.</td></tr>
<tr><td>5) Sta. No.</td><td>Displays the station No. set to each station.</td></tr>
<tr><td>6) Reserved station information</td><td>Displays whether or not the station is set as a reserved station.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>Reserved station</td><td>Set as a reserved station</td></tr>
<tr><td>—</td><td>No setting</td></tr>
</table></td></tr>
<tr><td>7) Error invalid station information</td><td>Displays whether or not the station is set as an error invalid station.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>Error invalid station</td><td>Set as an error invalid station</td></tr>
<tr><td>—</td><td>No setting</td></tr>
</table></td></tr>
<tr><td>8) Station type</td><td>Displays the set station type.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>Ver.1 Remote I/O station</td><td>Ver.1 Remote I/O station</td></tr>
<tr><td>Ver.1 Remote device station</td><td>Ver.1 Remote device station</td></tr>
<tr><td>Ver.1 Intelligent device station</td><td>Ver.1 Intelligent station, Ver.1 Local station</td></tr>
<tr><td>Ver.2 Remote device station</td><td>Ver.2 Remote device station</td></tr>
<tr><td>Ver.2 Intelligent device station</td><td>Ver.2 Intelligent station, Ver.1 Local station</td></tr>
</table></td></tr>
<tr><td>9) Occupied station count</td><td>Displays the number of occupied stations.</td></tr>
<tr><td>10) Status</td><td>Displays the status of each station.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>Normal</td><td>Normal communication is being performed.</td></tr>
<tr><td>Temporary error invalidity status</td><td>Communication is interrupted.</td></tr>
<tr><td>Data link error</td><td>A link error has occurred.</td></tr>
<tr><td>WDT error</td><td>A watchdog timer error has occurred.</td></tr>
<tr><td>Blown fuse confirmation error</td><td>A fuse has blown.</td></tr>
<tr><td>Repetition station No.</td><td>The station No. is repetitived.</td></tr>
<tr><td>Switch changing</td><td>The switch has been changed.</td></tr>
</table></td></tr>
<tr><td>11) Transient error</td><td>Displays the transient error status.
<table>
<tr><th>Display</th><th>Description</th></tr>
<tr><td>Transient transmission err</td><td>Error detected</td></tr>
<tr><td>—</td><td>No error</td></tr>
</table></td></tr>
<tr><td>12) Expanded cyclic setting</td><td>Displays the value set in the expanded cyclic setting.
<table>
<tr><th>Display</th></tr>
<tr><td>single</td></tr>
<tr><td>double</td></tr>
<tr><td>quadruple</td></tr>
<tr><td>octuple</td></tr>
</table></td></tr>
<tr><td>13) Remote station points</td><td>Displays the number of the remote station’s points.</td></tr>
</table>

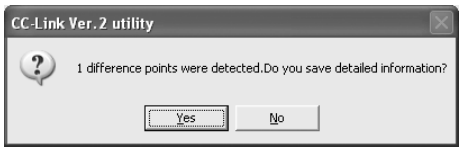
8.2.4 Operating the Online operation screen

The parameters are read from, written to and verified with the CC-Link Ver.2 board.


Board information
Other station monitor
Online operation
Parameter settings
Target settings
Memory I/O test
Test
Read parameter
Read parameter and target settings from CC-Link board driver to CC-Link utility.
Read
1)
Write parameter
Write parameter and target settings from CC-Link utility to CC-Link board driver.
Reset operation after writing parameter
Reset CC-Link boards that parameter was changed
Reset all CC-Link boards regardless of parameter changes
Write
2)
Verify parameter
Compare parameter and target settings between CC-Link utility and CC-Link board driver.
Verify
3)
Note : Parameter includes Parameter settings and Target settings.

Item	Description
1) Read button	Reads parameters from the CC-Link Ver.2 board.
2) Write button	Writes parameters to the CC-Link Ver.2 board. After writing the parameters, automatically resets the CC-Link Ver.2 board selected in "Reset operation after writing parameter".
3) Verify button	Compares the parameters written to the CC-Link Ver.2 board with those set in the utility. When an error occurs, the error location is displayed. ＊1

＊1: No error details are displayed on the Online operation screen.
If one or more errors are detected, the following dialog box appears.

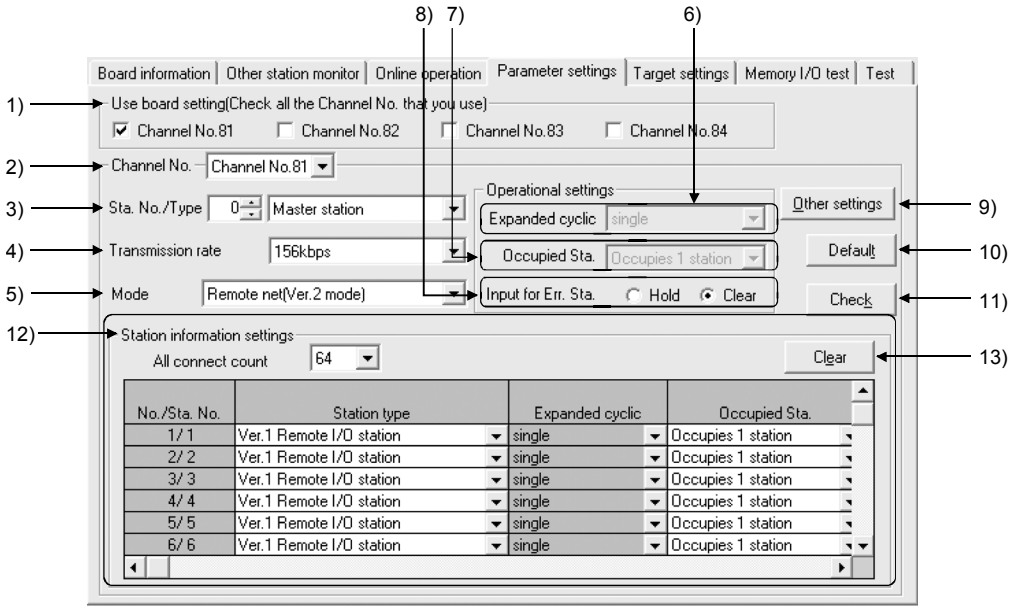


To check the error details, click "Yes" and specify where the information is to be saved.
The detailed error information is saved in the text file so that it can be checked using Windows® "Notepad", for example.

8.2.5 Operating the Parameter Settings screen

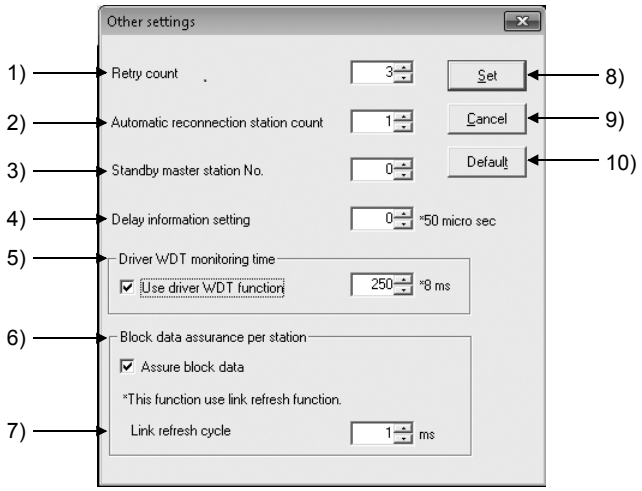
Various CC-Link Ver.2 board parameters are set on this screen.

(1) Parameter Settings screen



Item	Description
1) Use board setting	Select all channel No. of the CC-Link Ver.2 boards mounted on the PC.
2) Channel No.	Select the CC-Link Ver.2 board for which parameters are to be set.
3) Sta. No./Type	Set the station No. and station type.
4) Transmission rate	Set the transmission rate.
5) Mode	Set the operation mode.
6) Expanded cyclic	Make the expanded cyclic setting of the CC-Link Ver.2 board. This setting is allowed when "Sta. Type" is "Local station" and the mode is set to other than "Remote net Ver.1 mode".
7) Occupied Sta.	Set the occupied stations count for the CC-Link Ver.2 board (For local station only).
8) Input for Err. Sta.	Set how to handle input data in the event of a data link error.
9) [Other settings] button	Displays the Other settings screen.
10) [Default] button	Sets default values to the parameters. (Refer to table 6.1 in Section 6.1)
11) [Check] button	Checks the currently set parameters for any errors.
12) Station information settings	Set the total number of connected modules (All connect count) and station information of each module.
13) [Clear] button	Clears the parameters within the "Station information settings" area to the default values.

(2) Other settings screen



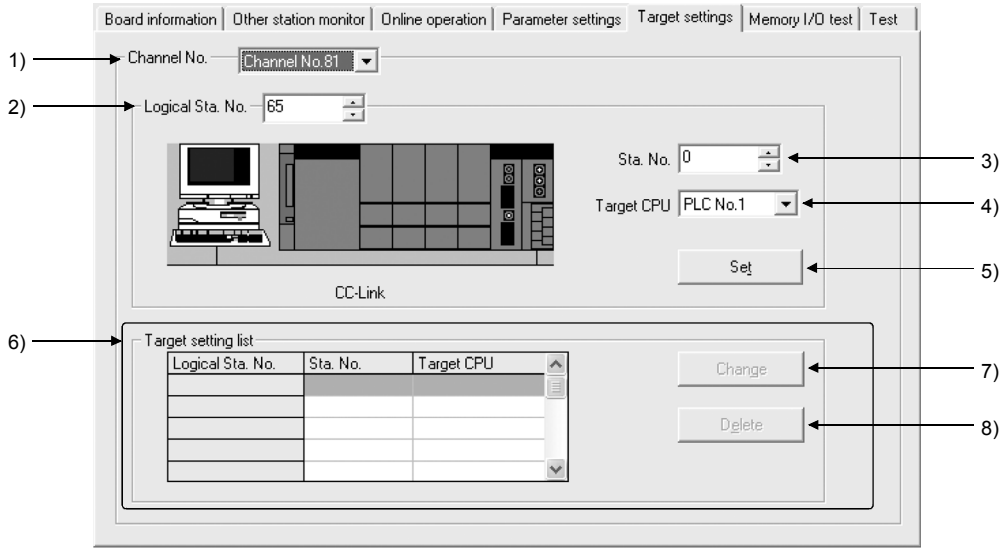
Item	Description
1) Retry count	Set the retry count for the case of a communication error (when a transient transmission error occurs).
2) Automatic reconnection station count	Set the number of modules that can be automatically returned in one link scan.
3) Standby master station No.	Set the station No. of the standby master station.
4) Delay information setting	Set 0 to "Delay information setting".
5) Driver WDT monitoring time	Select "Use driver WDT function" to enable the function. Set the driver WDT monitoring time. (1 to 32767)
6) Block data assurance per station	Select "Assure block data" to enable this function.
7) Link refresh cycle	Set the link refresh cycle. (1 to 1000) *1
8) [Set] button	Saves the settings and closes the Other settings screen.
9) [Cancel] button	Closes the Other settings screen without saving the settings.
10) [Default] button	Set default values as parameters in the Other settings. (Refer to Table 6.1 in Section 6.1.)

*1: The link refresh cycle can be set only when block data assurance per station setting is enabled.

POINT
For details of the parameter settings, refer to Chapter 6.

8.2.6 Operating the Target settings screen

Set the logical station number to access a multiple CPU system.



Item	Description
1) Channel No.	Select the channel for setting the Target.
2) Logical Sta. No.	Enter the logical station number to be set or modified. (Setting range: 65 to 239)
3) Sta. No.	Enter the station No. of the CC-Link module that is controlled by the multiple CPU system. (Setting range: 0 to 63)
4) Target CPU	Select the target multi-CPU to be accessed.
5) [Set] button	Registers the settings and/or their changes into the Target Setting List.
6) Target setting list	Displays the setting details of the selected target channel No. as a list.
7) [Change] button	Selecting the row to be changed in the Target Setting List and clicking this button changes the registered data. (Double-clicking the row makes the same result.)
8) [Delete] button	Select a row in the Target Setting List and clicking this button deletes the data of the registered logical station No.

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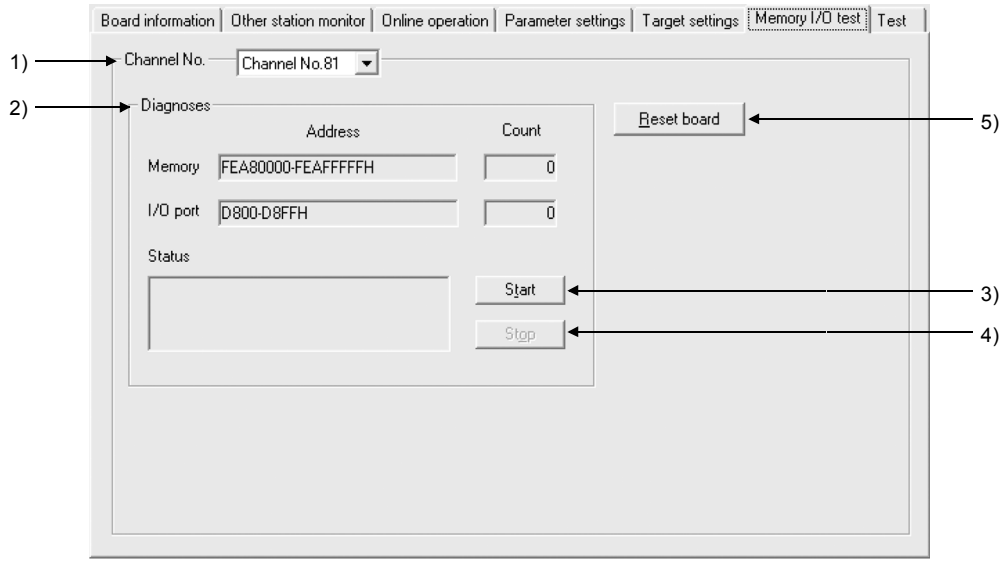
8.2.7 Operating the Memory I/O test screen

The Memory I/O test screen diagnoses the dual-port memory and I/O port used by the CC-Link Ver.2 board.

POINT

(1) Before starting a diagnostic operation, be sure to disconnect the external cable.

(2) To switch windows during a diagnostic operation, click the Stop button to stop the diagnosis and then switch screens.



Item	Description
1) Channel No.	Select the channel to be diagnosed.
2) Diagnoses	Displays the addresses of the 2-port memory and I/O port being diagnosed, the number of diagnoses and the status.
3) Start button	Starts the 2-port memory and I/O port diagnosis on the selected channel.
4) Stop button	Stops the currently executing 2-port memory and I/O port diagnosis, and updates the count and status.
5) Reset board button	Resets the CC-Link Ver.2 board.

8.2.8 Operating the Test screen

The Test screen is used to test the installed CC-Link Ver.2 board.

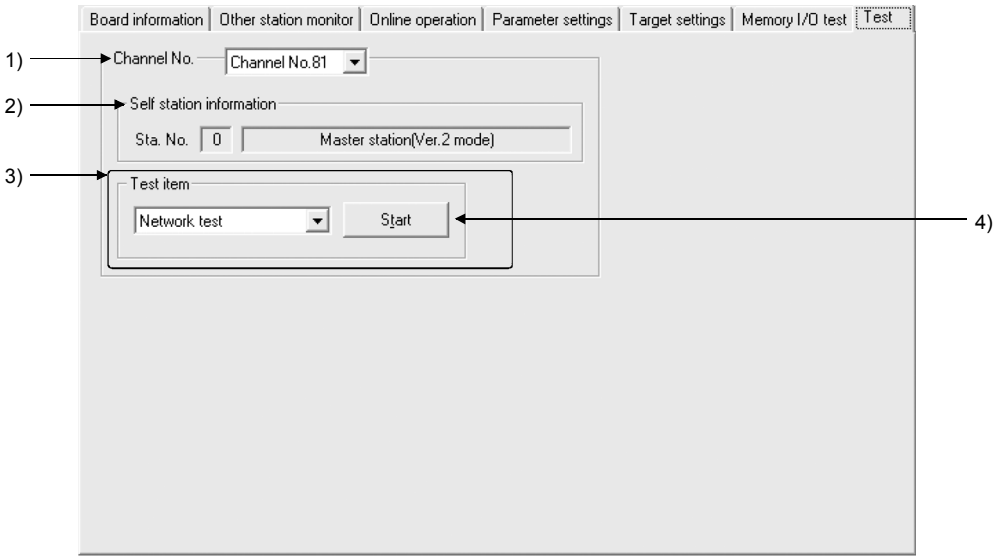
POINT

(1) Depending on the station type and operation mode parameters written to the CC-Link Ver.2 board, test availability varies.
The following table shows each test can be selected or not.

○: Selectable ×: Not selectable

Test item \ Station type / Mode	Master station		Other than master station	
	Other than offline	Offline	Other than offline	Offline
Hardware test	○	○	○	○
Line test (Hardware)	○	○	×	×
Line test (Software)	○	×	×	×
Network test	○	×	○	×

(2) When an error occurs in the Test, refer to Chapter 15 to check the error description and take corrective action.
For error codes when executing functions, refer to MELSEC Data Link Library Reference Manual.



Item	Description
1) Channel No.	Sets the channel to be tested.
2) Self station information	Displays the station No., station type and operation mode of the selected channel.
3) Test item	Select the test to be executed. For details, refer to "(1) About tests".
4) Start button	Executes the selected test.

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(1) About tests

The following describes each of the tests.

(a) Hardware test

This test is used to check the hardware operation before configuring the system or to check whether or not the CC-Link Ver.2 board is operating properly when the data link is not performed correctly.

POINT

(1) Before starting the hardware test, disconnect the CC-Link cable.
Also, connect a terminating resistor between terminals DA and DB.
(2) The transmission rate during the hardware test execution is equal to the current parameter setting value.
(3) The CC-Link Ver.2 board is automatically reset before and after execution of the hardware test.
(4) WDT error message is registered to Event viewer to perform WDT test.

[Operation Procedure]

After selecting "Hardware test" in the Test item, click the [Start] button.
Test result will be displayed after hardware test execution.

Test result monitor (at normal completed)

(b) Line test (Hardware)

For slave stations connected to the master station, this test is used to check whether or not all modules of station No.1 to 64 (All stations) or a specific module (Selected Station) is connected correctly with the CC-Link cable(s) and the data link is enabled.
This test is effective when the data link is not available due to an error, for example.

POINT

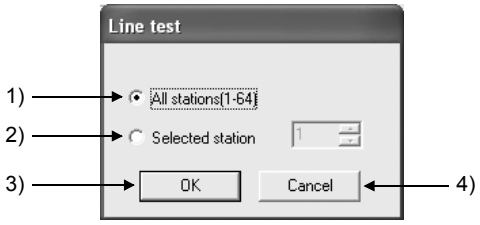
(1) Executing this test during data link stops the data link.
(2) Use "Selected Station" on the Line test screen for any of the error stations detected in the "All stations (1 to 64)" test.
(3) The CC-Link Ver.2 board is automatically reset before and after execution of the hardware test.
(4) Specifying "All stations (1 to 64)" with not all of 64 stations connected to the CC-Link system and executing this test will cause unconnected stations to be detected as error stations.
(5) Do not set the transmission speed of the slave station to "Auto Following" when executing a line test (hardware). Set the transmission speed of a slave station as the same as that of the master station (156 kbps to 10 Mbps). An abnormal completion of the line test (hardware) may occur in slave stations with transmission speed set to "Auto Following" only.

POINT
(6) The setting of "Standby Master Station No." in the network parameter is required to execute a line test (hardware) for the standby master station. (7) When data link has started by the standby master station, a line test (hardware) cannot be executed.

[Operation Procedure]

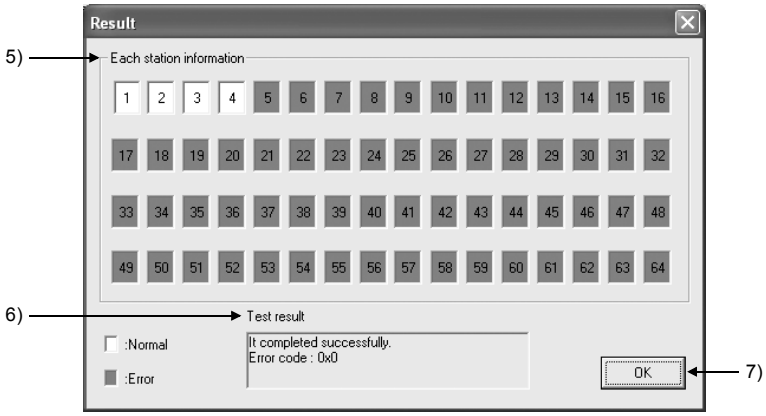
After selecting "Line test (Hardware)" in the Test item, click the [Start] button. The line test screen appears.

Line test screen



Item	Description
1) All stations (1 to 64)	Select this when performing the line test on all stations.
2) Selected station	Select this when performing the line test on a single station. (Setting range: 1 to 64)
3) OK button	Executes the test.
4) Cancel button	Cancels the test.

Line test result screen (For "All stations (1-64)" only)



(Display when 4 stations are connected.)

Item	Description
5) Each station information	Displays the information of each station. White: Normal station, Red: Error station
6) Test result	Displays the status of each station. In the event of an error, the error code is displayed.
7) OK button	Closes the line test result screen.

(c) Line test (Software)

This test is used to check the connection with all modules of station No. 1 to 64 (All stations) or a specific module (Selected station) with parameters set and the data link being performed.

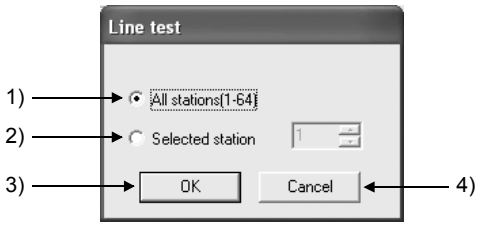
POINT

(1) The Line test (Software) is executable only when the data link status of the CC-Link Ver.2 board is "In data link" or "During Auto-Returning."
(2) Use "Station Specification" on the Circuit test screen for any of the error stations detected in the "All stations (1 to 64)" test.

[Operation Procedure]

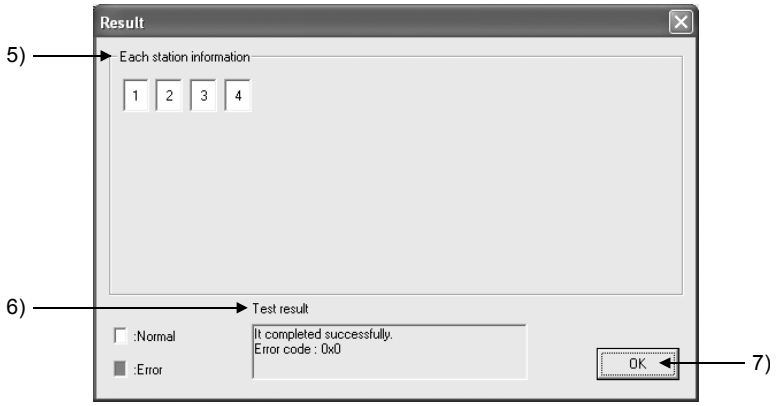
After selecting "Line test (Software)" in the Test item, click the [Start] button. The line test screen appears.

Line test screen



Item	Description
1) All stations (1-64)	Select this when performing the line test on all stations.
2) Selected station	Select this when performing the line test on a single station. (Setting range: 1 to 64)
3) OK button	Executes the test.
4) Cancel button	Cancels the test.

Line test result screen (For "All stations (1-64)" only)



(Display when 4 stations are connected.)

Item	Description
5) Each station information	Displays the information of each station. White: Normal station, Red: Error station
6) Test result	Displays the status of each station. In the event of an error, the error code is displayed.
7) OK button	Closes the line test result screen.

(d) Network test

This is used to test the start or stop of the data link after connecting CC-Link cables or after establishing the data link.

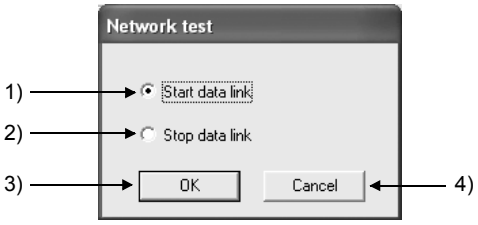
POINT

(1) When the data link of the master station is stopped, the data link of the entire CC-Link system is stopped.

(2) The Network test is executable only when the Data link status of the CC-Link Ver.2 board is "In data link", "Suspend data link" or "During Auto-Returning."

[Operation Procedure]

After selecting "Network test" in the Test item, click the [Start] button. The Network test screen appears.



Item	Description
1) Start data link	Starts the data link.
2) Stop data link	Stops the data link.
3) OK button	Starts the test.
4) Cancel button	Cancels the test.

8.3 Device Monitor Utility

This section explains how to set up and operate the Device Monitor Utility.
For accessible devices, refer to the "MELSEC Data Link Library Reference Manual".

POINT

In the Device Monitor Utility, the identical data are displayed for SB (link special relay) and SM (special relay) when accessing the own station.
Also, the identical data are displayed for SW (link special register) and SD (special register).

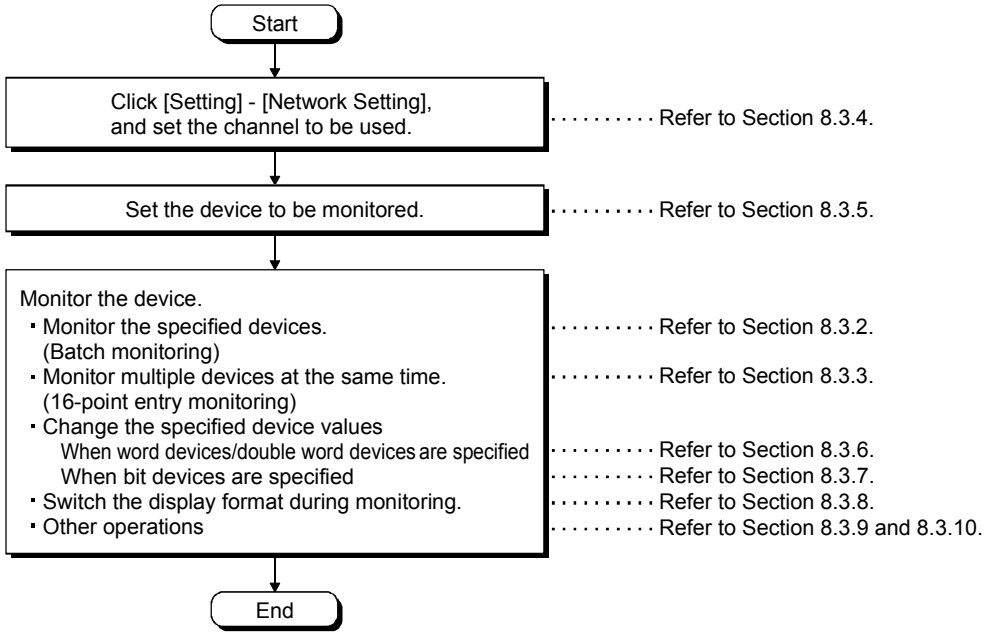
8.3.1 Overview

(1) Overview

Device Monitor Utility is a utility to monitor devices and change current values.

(2) Operation flow

The following explains the operating procedure of the Device Monitor Utility.


Start
Click [Setting] - [Network Setting], and set the channel to be used.
Refer to Section 8.3.4.
Set the device to be monitored.
Refer to Section 8.3.5.
Monitor the device.
・Monitor the specified devices. (Batch monitoring)
Refer to Section 8.3.2.
・Monitor multiple devices at the same time. (16-point entry monitoring)
Refer to Section 8.3.3.
・Change the specified device values
When word devices/double word devices are specified
Refer to Section 8.3.6.
When bit devices are specified
Refer to Section 8.3.7.
・Switch the display format during monitoring.
Refer to Section 8.3.8.
・Other operations
Refer to Section 8.3.9 and 8.3.10.
End

(3) List of the functions

The following explains the functions of the device monitor utility.

Function		Description	Reference
Menu	Batch monitor	Batch monitors one type of devices.	Section 8.3.2
	16-point register monitor	Monitors multiple devices simultaneously in units of 16 points.	Section 8.3.3
	Exit	Exits the device monitor utility.	Section 8.1.2
Setting	Network setting	Sets a programmable controller CPU or board to be monitored.	Section 8.3.4
	Device setting	Set devices to be monitored.	Section 8.3.5
Device Write	Data changing	Changes word device/double word device values.	Section 8.3.6
	Continuous change in data	Changes sequenced word devices/double word devices to a same value.	
	Bit device setting	Turns bit devices ON.	Section 8.3.7
	Bit device resetting	Turns bit devices OFF.	
Data Format	Word device	Changes a display format of word devices.	Section 8.3.8
	Double Word device	Changes a display format of double word devices.	
	Bit device	Changes a display format of bit devices.	
Option	Numerical Pad	Enables/disables the setting to use the numerical pad.	Section 8.3.9
Help	Help	Displays the help screen.	-
	Version	Displays the version information.	-

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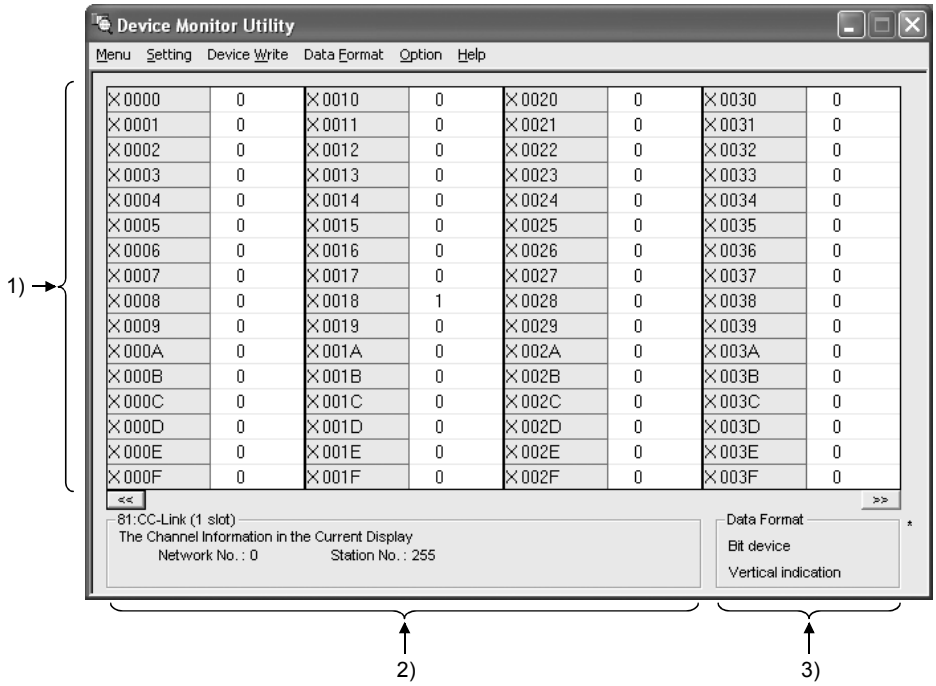
8.3.2 Setting the batch monitoring

Set the Device Monitor Utility so that it monitors only a single designated device.

(1) Menu selection

Select [Menu] - [Batch monitor] on the menu bar.
(Selectable for 16-point register monitor only.)

(2) Display screen



Item	Description
1) Device Information*1	Display the current device status. To change the data format, refer to Section 8.3.8.
2) Network Status	Display the status of the network that is currently set. To set up the network, refer to Section 8.3.4.
3) Data Format	Show the data format and the type of the device being displayed (word device, double word device, and bit device). To change the device type, refer to Section 8.3.5. To change the data format, refer to section 8.3.8.

*1: The number of displayed columns will differ depending on the settings of a connection target CPU and display format.

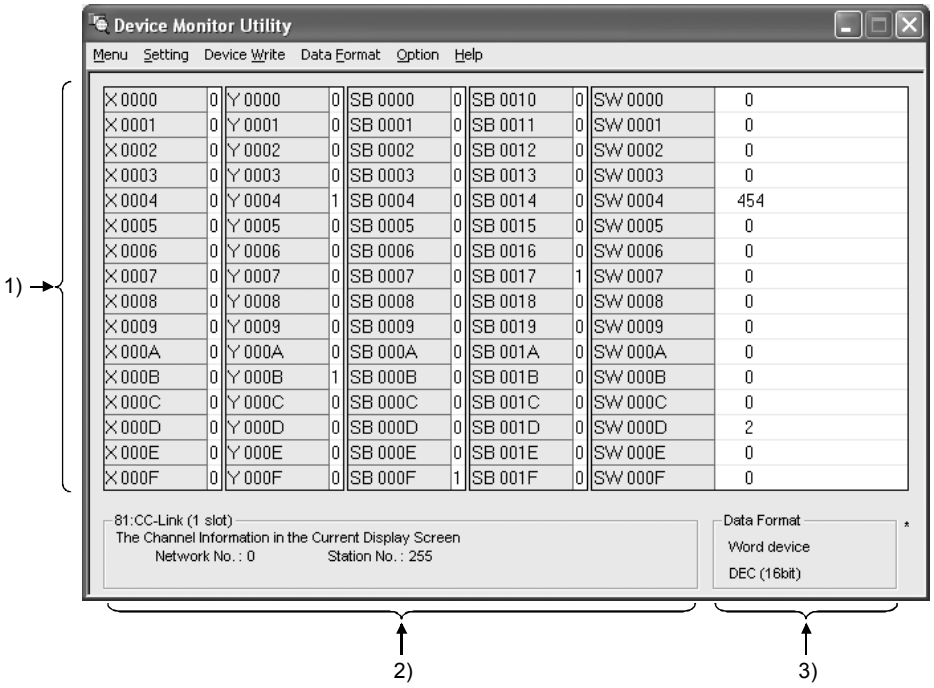
8.3.3 Setting the 16-point register monitor

Set the Device Monitor Utility so that it monitors up to five bit devices and one word device/double word device simultaneously.

(1) Menu selection

Select [Menu] - [16- point register monitor] on the menu bar.
(Selectable for batch monitoring only.)

(2) Display screen



Item	Description
1) Device Information*1	Display the current device status. To change the data format, refer to Section 8.3.8.
2) Network Status	Display the status of the network that is currently set. To set up the network, refer to Section 8.3.4.
3) Data Format	Show the data format and the type of the device being displayed (word device, double word device, and bit device). To change the device type, refer to Section 8.3.5. To change the data format, refer to Section 8.3.8.

*1: The number of displayed columns will differ depending on the settings of a connection target CPU and display format.

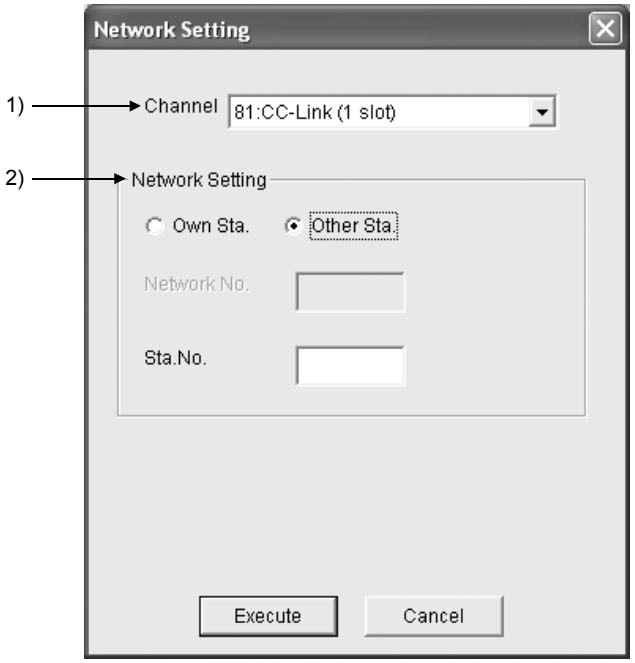
8.3.4 Setting the monitoring destination

This section describes how to set up the network to be used when performing device monitoring.
The destination should be specified when starting the Device Monitor Utility.

(1) Menu selection

Select [Setting] - [Network setting] on the menu bar.

(2) Dialog box



Item	Description
1) Channel	Set the channel to be used.
2) Network Setting	Set the own and other stations as well as the network number and station number.

POINT

(1) To access a multiple CPU system, select other station, then enter the value of the "logical station number" set with the CC-Link Ver.2 utility for the station number.
(2) Do not designate a remote I/O station or an intelligent device station connected to the CC-Link as the monitor destination. If designated, an error will occur.
(3) When own station is selected in the network setting, network No. "0" and station No. "255" are displayed as the network status.

8.3.5 Setting the device to be monitored

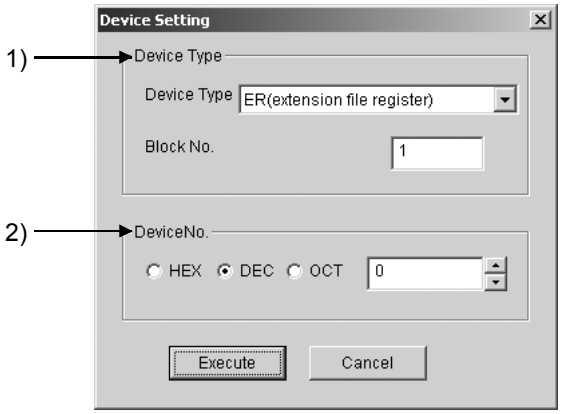
This section describes how to set up the device to be monitored.

(1) Menu selection

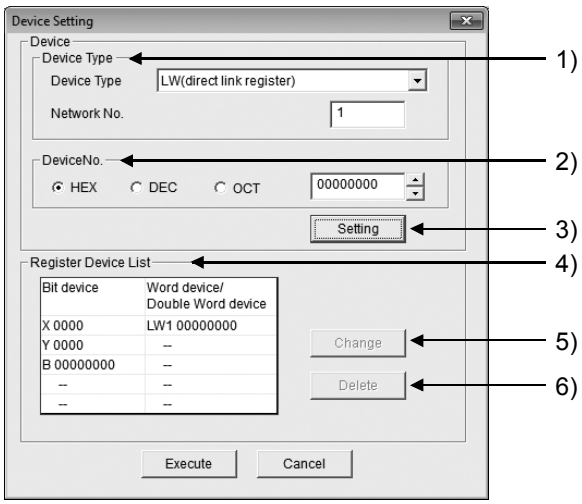
Select [Setting] - [Device setting] on the menu bar.

(2) Dialog box

For batch monitoring



For 16-point entry monitoring



Item	Description
1) Device Type	Set a type of a device whose value is to be changed. • Enter a block number for ER. • Enter a network number for LX, LY, LB, LW, LSB, and LSW. • Enter a value of start I/O number divided by 16 in decimal for SPG To monitor the own station device of the CC-Link Ver.2 board, set as shown below:
2) Device No.	Set a head number of a device to be monitored. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)
3) [Setting] button	Register the items set for Device Type and Device No., and then add them to the Register Device List.
4) Register Device List	Display a list of registered devices.
5) [Change] button	Select a device to be changed. Click this button to change the registered data.
6) [Delete] button	Select a device to be deleted. Click this button to delete the device from the Registered Device List.

Own station device to be monitored	Device type to be designated
RX	X
RY	Y
SB	SM
SW	SD
RWw	Ww
RWr	Wr
Random access buffer	MRB
Buffer memory	SPB

POINT

The only devices that can be monitored by the 16-point entry monitoring are those that random access is performable. If any device that does not allow random access is designated, a device type error(-3) will occur. For whether or not each device allows random access, refer to MELSEC Data Link Library Reference Manual.

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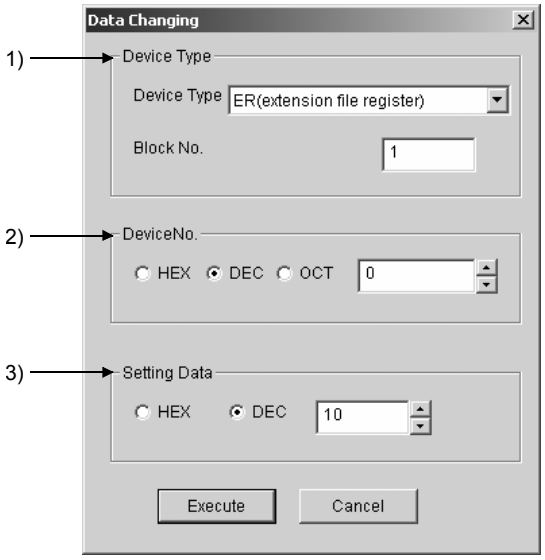
8.3.6 Changing word device/double word device values

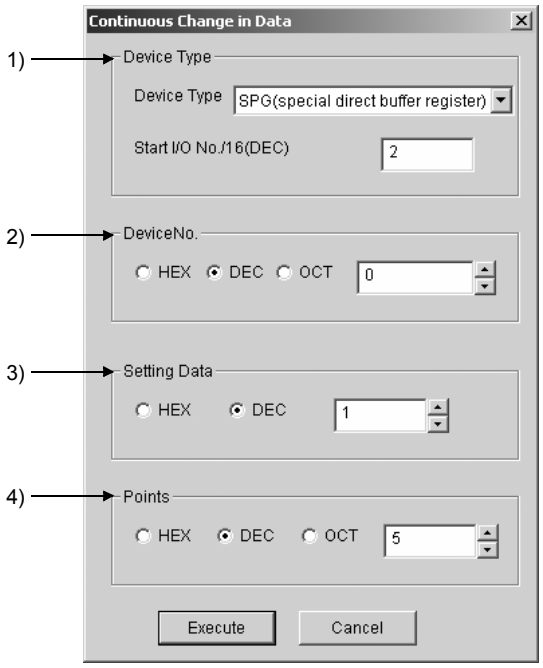
Change the specified word device/double word device value.

(1) Menu selection

Select [Device Write] - [Data changing] / [Continuous change in data] on the menu bar.

(2) Dialog box





Item	Description
1) Device Type	Set a type of a device whose value is to be changed. • Enter a block number for ER. • Enter a network number for LW and LSW. • Enter a value of start I/O number divided by 16 in decimal for SPG
2) Device No.	Set a number of a device whose value is to be changed. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)
3) Setting Data	Set a value to be changed. (HEX: Hexadecimal, DEC: Decimal) *1
4) Points	Set the number of points to perform continuous change of values. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)

*1: When the DEC (Decimal) is selected, only signed decimal format can be specified.

WARNING

- Configure an interlock circuit in a sequence program so that the entire system works safely at all times when controlling the data change to the programmable controller during operation.
  Also, determine which corrective actions to take in the event of a data communication error between the personal computer and programmable controller CPU in use.

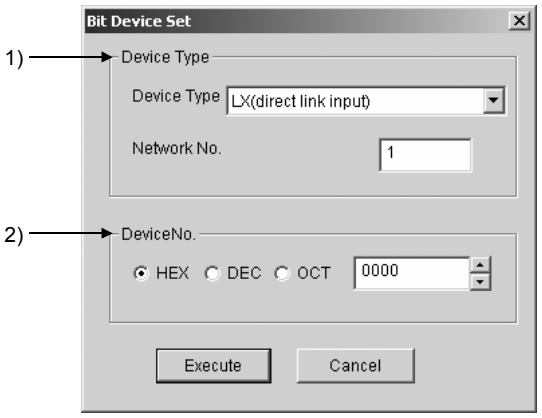
8.3.7 Switching a bit device on/off

The designated bit device can be switched on/off as follows:

(1) Menu selection

Select [Device Write] - [Bit device setting] / [Bit device resetting] on the menu bar.

(2) Dialog box



Item	Description
1) Device Type	Set a type of a device whose value is to be changed. • Enter a network number for LX, LY, LB and LSB.
2) Device No.	Set the number of a device whose value is to be changed. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)

⚠WARNING

- Configure an interlock circuit in a sequence program so that the entire system works safely at all times when controlling the data change to the programmable controller during operation.
  Also, determine which corrective actions to take in the event of a data communication error between the personal computer and programmable controller CPU in use.

8.3.8 Switching Display Format

This section explains a method for switching a display format (such as in hexadecimal or in decimal) of device information for monitoring.

(1) Menu selection

Select [Data Format] - [Word device] / [Double Word device] / [Bit device] on the menu bar.

The following sections (2), (3), and (4) show the menus that can be selected with the Batch monitor and 16-point register monitor functions.

(2) Word device

Display format	Batch monitor	16-point register monitor
DEC (decimal) (signed 16 bits)	○	○
DEC (decimal) (unsigned 16 bits)	○	○
HEX (hexadecimal) (16 bits)	○	○
OCT (octal) (16 bits)	○	○
BIN (binary) (16 bits)	○	-
DEC (decimal) (signed 32 bits)	○	○
DEC (decimal) (unsigned 32 bits)	○	○
HEX (hexadecimal) (32 bits)	○	○
OCT (octal) (32 bits)	○	○
BIN (binary) (32 bits)	○	-

(○: Can be displayed, - : Cannot be displayed)

(3) Double Word device

Display format	Batch monitor	16-point register monitor
DEC (decimal) (signed 32 bits)	○	○
DEC (decimal) (unsigned 32 bits)	○	○
HEX (hexadecimal) (32 bits)	○	○
OCT (octal) (32 bits)	○	○
BIN (binary) (32 bits)	○	-

(○: Can be displayed, - : Cannot be displayed)

(4) Bit device

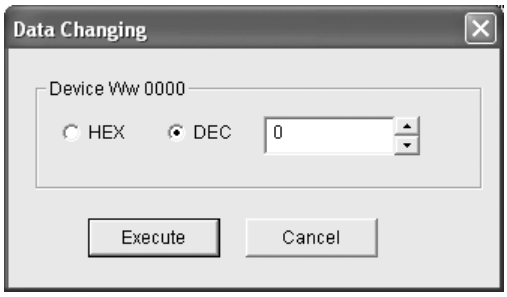
Display format	Batch monitor	16-point register monitor
Vertical Indication	○	-
Horizon Indication (F-0) (decimal)	○	-
Horizon Indication (F-0) (hexadecimal)	○	-
Horizon Indication (0-F) (decimal)	○	-
Horizon Indication (0-F) (hexadecimal)	○	-

(○: Can be displayed, - : Cannot be displayed)

8.3.9 Numerical pad

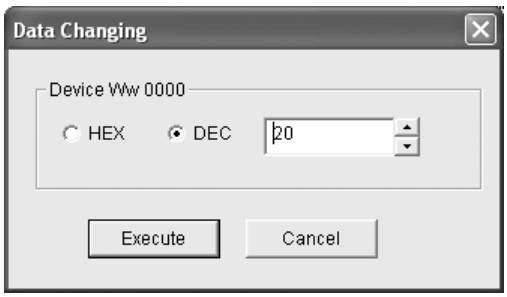
The Numerical Pad can be used to set device values and other numeric values. To display the Numerical Pad, select [Option] - [Numerical Pad] on the menu bar.

1. Click the numeric value input field.



2. The Numerical Pad is displayed. Enter a desired value by pressing the corresponding buttons, and then click the [OK] button.

3. The value is entered in the system.



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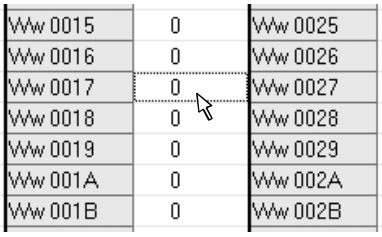
8.3.10 Other operations

By double-clicking a device number on the Device Monitor Utility window, the word device/double word device data can be changed or the bit device can be switched between on and off.

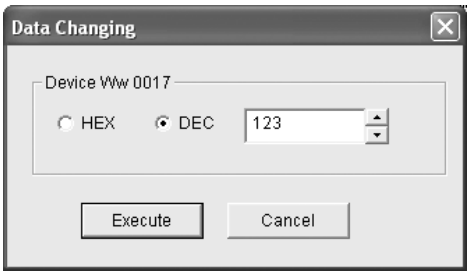
(1) Word device/Double Word device

The following explains how to change the device.

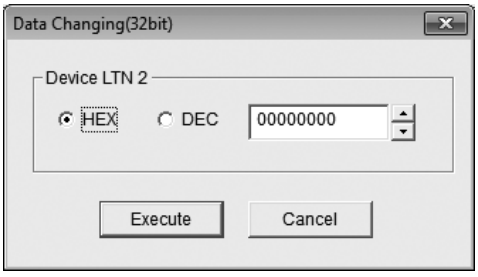
1. Double-click the number of the device to be changed.



2. When the following Data Changing dialog box appears, set a desired value, and then click the [Execute] button.

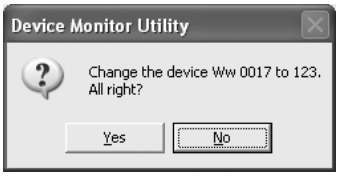


*: When the display format is 32-bit, "Data changing (32 bit)" is displayed on the title.



*: When the display format is decimal (unsigned 16 bits) or decimal (unsigned 32 bits), the value same as the display format can be set.

3. Select [Yes] in the dialog box shown below to change the word device.
   Select [No] to cancel the change operation.

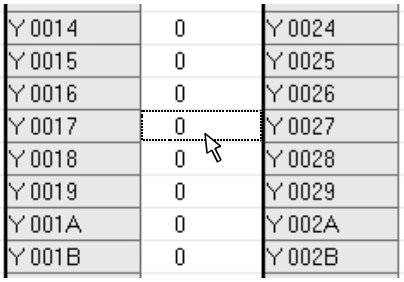


⚠WARNING • Configure an interlock circuit in a sequence program so that the entire system works safely at all times when controlling the data change to the programmable controller during operation.
Also, determine which corrective actions to take in the event of a data communication error between the personal computer and programmable controller CPU in use.

(2) Bit device

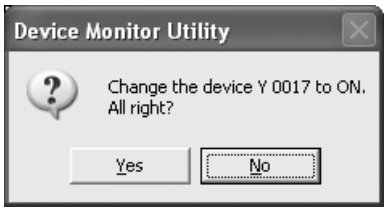
The following explains how to switch the bit device on/off.
Note that this operation is enabled only when the data format is [Vertical Indication].

1. Double-click the number of the bit device to be changed.



Y 0014	0	Y 0024
Y 0015	0	Y 0025
Y 0016	0	Y 0026
Y 0017	0	Y 0027
Y 0018	0	Y 0028
Y 0019	0	Y 0029
Y 001A	0	Y 002A
Y 001B	0	Y 002B

2. Select [Yes] in the dialog box shown below to change the bit device status.
Select [No] to cancel the change operation.



⚠WARNING • Configure an interlock circuit in a sequence program so that the entire system works safely at all times when controlling the data change to the programmable controller during operation.
Also, determine which corrective actions to take in the event of a data communication error between the personal computer and programmable controller CPU in use.

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MEMO

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9 MELSEC DATA LINK LIBRARY

This chapter explains an overview of the functions included in the MELSEC Data Link Library.

The functions provided by the MELSEC Data Link Library are used when creating a user program that communicates with a programmable controller CPU. With these functions, the user can perform communications without worrying about the hardware type of the destination device or the communication protocol.

The following table lists the functions that are provided by the MELSEC Data Link Library that comes with the utility software.

Function name	Description
mdOpen	Opens a communication line.
mdClose	Closes a communication line.
mdSendEx	Batch writes devices. (Extended function*1)
mdReceiveEx	Batch reads devices. (Extended function*1)
mdRandWEx	Writes devices randomly. (Extended function*1)
mdRandREx	Reads devices randomly. (Extended function*1)
mdDevSetEx	Sets a bit device. (Extended function*1)
mdDevRstEx	Resets a bit device. (Extended function*1)
mdTypeRead	Reads the programmable controller CPU type.
mdControl	Remote operation of the programmable controller CPU. (RUN/STOP/PAUSE)
mdBdRst	Resets the board.
mdBdModSet	Sets the mode of the board.
mdBdModRead	Reads the mode of the board.
mdBdLedRead	Reads the LED information of the board.
mdBdSwRead	Reads the switch status of the board.
mdBdVerRead	Reads the version information of the board.
mdInit	Refresh the programmable controller device information table.
mdSend	Performs batch write of devices.
mdReceive	Performs batch read of devices.
mdRandW	Writes to devices randomly.
mdRandR	Reads from devices randomly.
mdDevSet	Sets a bit device.
mdDevRst	Resets a bit device.

*1: A function in which the access range is extended according to the extension of the device points at the access target. It is accessible to all device numbers. Use extended functions when creating a new program.

POINT
For details of the functions, refer to MELSEC Data Link Library Reference Manual.

MEMO

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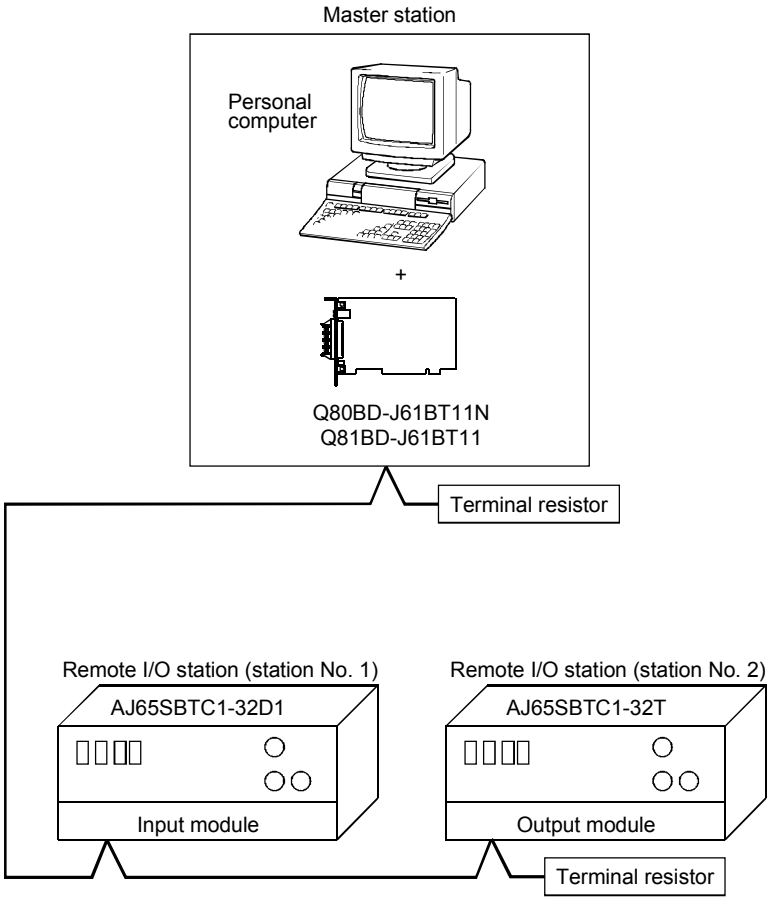
10 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE I/O STATIONS

This section gives a system configuration example to explain the CC-Link Ver.2 board and remote I/O station setting, parameter setting, programming and operation check.

10.1 Configuring a System

In this example, a system consisting of a master station and two remote I/O stations as shown below is used.



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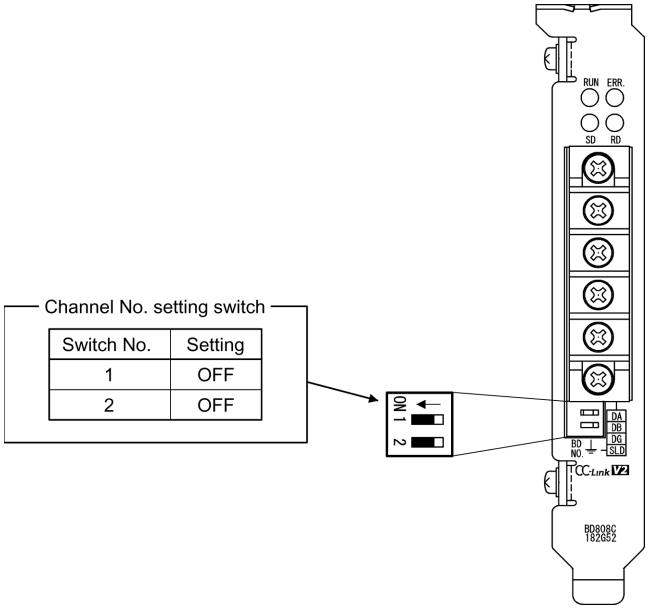
10.2 Setting up the master station

This section explains the master station setting.

10.2.1 Switch setting (channel No. setting)

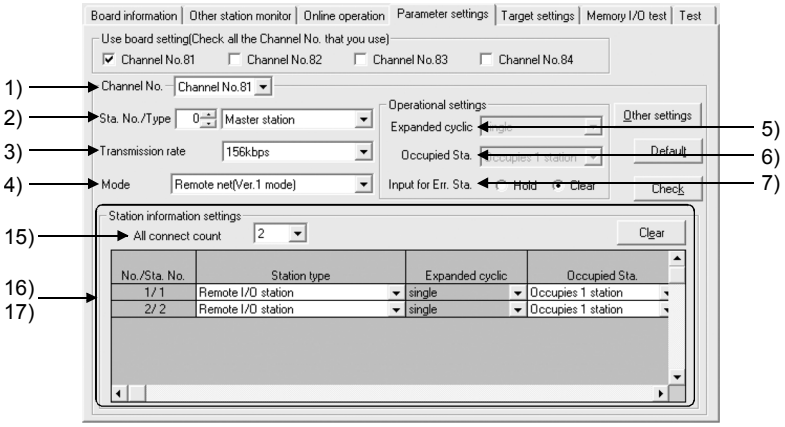
The channel No. for the CC-Link Ver.2 board is set to 81 as an example in this section.



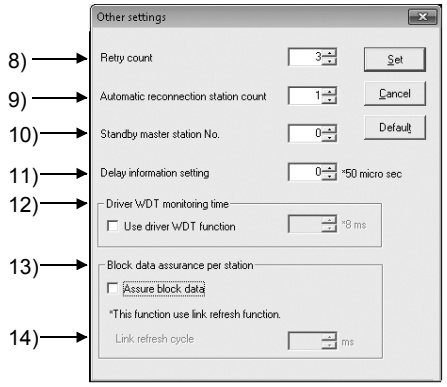
10.2.2 Parameter settings

The following shows the master station's parameter settings by the CC-Link Ver.2 Utility.

<Parameter settings screen>



<Other settings screen>



(1) Parameter settings

The following shows the parameter setting values. The parameter setting check list and the station information setting check list in Appendix can be used for the setting.

Table 10.1 Parameter Setting Check List

Setting item		Setting range/Item	
1) Channel No.		Channel No. 81 / Channel No.82 Channel No. 83 / Channel No.84	
2) Sta. No./Type		No.0	Master station / Local station / Standby master station
3) Transmission rate		156kbps / 625kbps / 2.5Mbps / 5Mbps / 10Mbps	
4) Mode		Remote net [Ver.1 mode] / Remote net [Ver.2 mode] Remote net [Additional mode] / Off line	
Operational settings	5) Expanded cyclic	single / double / quadruple / octuple	
	6) Occupied Sta.	Occupies 1 station / Occupies 2 stations Occupies 3 stations / Occupies 4 stations	
	7) Input for Err. Sta.	Hold / Clear	
Other settings	8) Retry count	3 Times	
	9) Automatic reconnection station count	1 Modules	
	10) Standby master station No.	No.0	
	11) Delay information setting	0 × 50 micro sec	
	12) Driver WDT Monitoring Time	No setting / × 8 ms	
	13) Block data assurance per station	Disable / Enable	
	14) Link refresh cycle	No setting / ms	
Station information settings	15) All connect count	2 Modules	

Table 10.2 Station Information Setting Check List

Sta. No.	Station type	Expanded cyclic	Occupied Sta.	Remote station points	Reserve/invalid station select	Intelligent buffer select (word)		
						Send	Receive	Automatic
16) 1	Remote I/O station	single	Occupies 1 station	32 points	No setting			
17) 2	Remote I/O station	single	Occupies 1 station	32 points	No setting			
3								

10.3 Setting up the remote I/O stations

The settings of the remote I/O station switches are shown below:

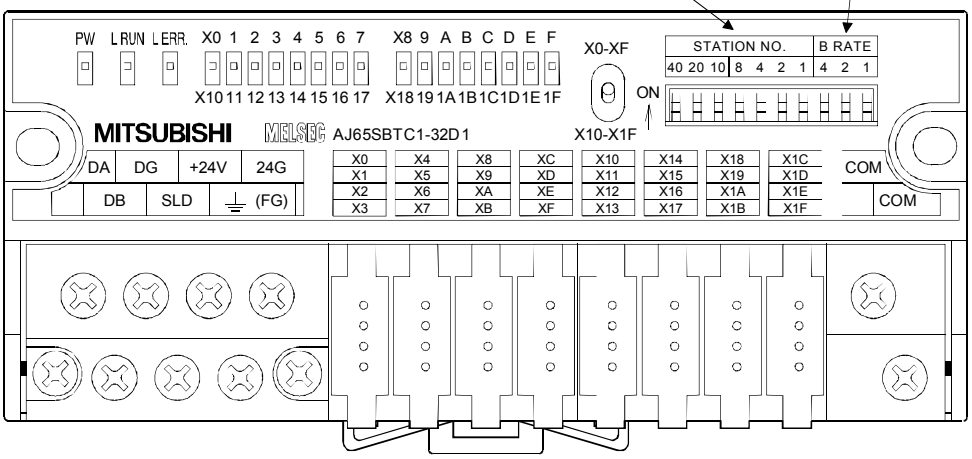
Station No. setting switch

Module	Station No.	No. of tens			No. of units			
		40	20	10	8	4	2	1
AJ65SBTC1-32D1	1	OFF	OFF	OFF	OFF	OFF	OFF	ON
AJ65SBTC1-32T	2	OFF	OFF	OFF	OFF	OFF	ON	OFF

Transmission speed setting switch

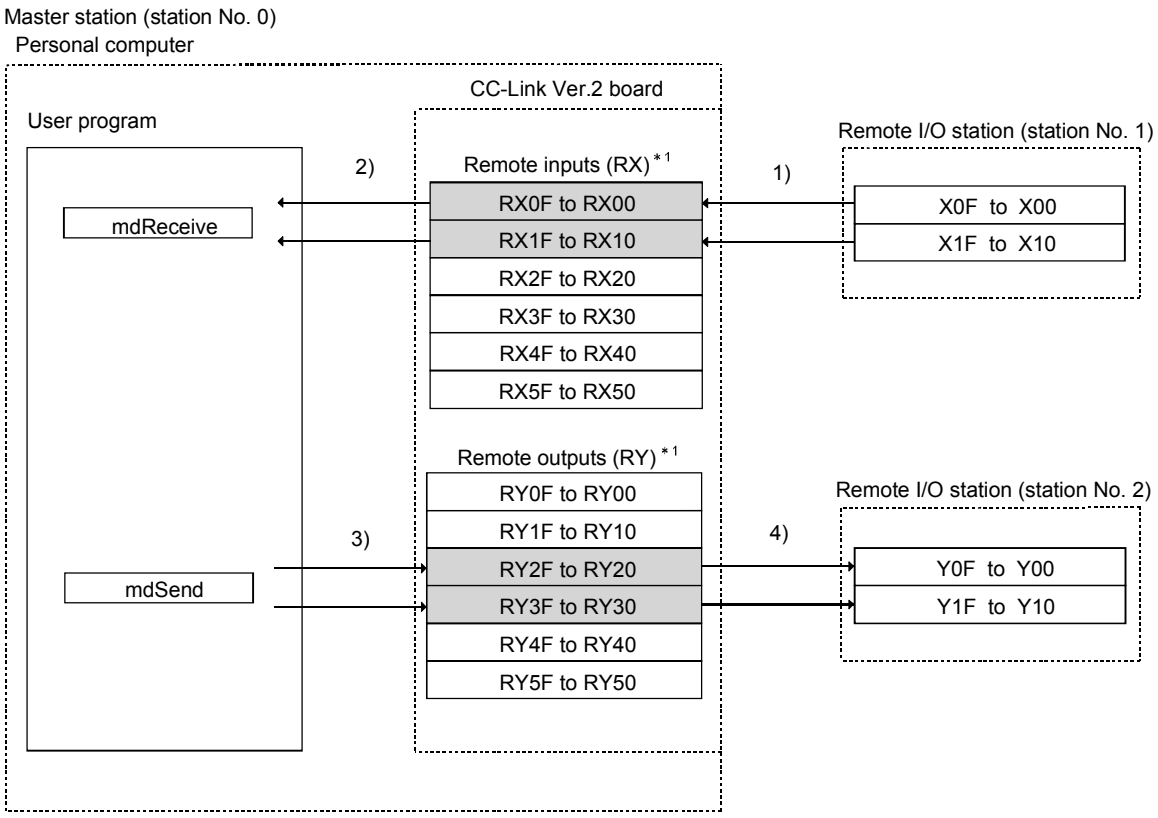
0 (156 kbps)

Setting value	Setting switch status			Transmission speed
	4	2	1	
0	OFF	OFF	OFF	156 kbps


PW L RUN L ERR. X0 1 2 3 4 5 6 7 X8 9 A B C D E F
X10 11 12 13 14 15 16 17 X18 19 1A 1B 1C 1D 1E 1F
X0-XF
X10-X1F
ON
STATION NO.
40 20 10 8 4 2 1
B RATE
4 2 1
MITSUBISHI
MELSEC AJ65SBTC1-32D1
DA DG +24V 24G
DB SLD (FG)
X0 X1 X2 X3 X4 X5 X6 X7 X8 X9 XA XB XC XD XE XF X10 X11 X12 X13 X14 X15 X16 X17 X18 X19 X1A X1B X1C X1D X1E X1F
COM
COM

10.4 Creating a Program

This section explains how the created program reads data from the remote input (RX) and writes them to the remote output (RY) in communications with remote I/O stations. The following illustrates the relation between the remote I/O stations' I/O operations and the user program when controlling the remote I/O stations. (The shaded areas indicate the devices that are actually used.)



*1: When the remote net Ver.2 mode is selected, refer to the figure in Section 4.4.7(1).
When the remote net additional mode is selected, refer to the figure in Section 4.4.7(2).

User Program	CC-Link Ver.2 Board
2) The remote input data (RX) of the CC-Link Ver.2 board are read out. Arguments to be set: Station No.=0xFF (own station) Device type=0x1 (own station RX) Device No. =0x0	← 1) The input data (X) of the remote I/O station are stored into the remote input (RX) on the CC-Link Ver.2 board by the link scan.
3) Data are written to the remote output (RY) of the CC-Link Ver.2 board. Arguments to be set: Station No.=0xFF (own station) Device type=0x2 (own station RY) Device No. =0x20	→ 4) The remote output data (RY) of the CC-Link Ver.2 board are output to the remote I/O station.

10.5 Executing the Data Link

To start the data link, first power on the remote I/O stations, and then the master station.

10.5.1 Checking the data link status

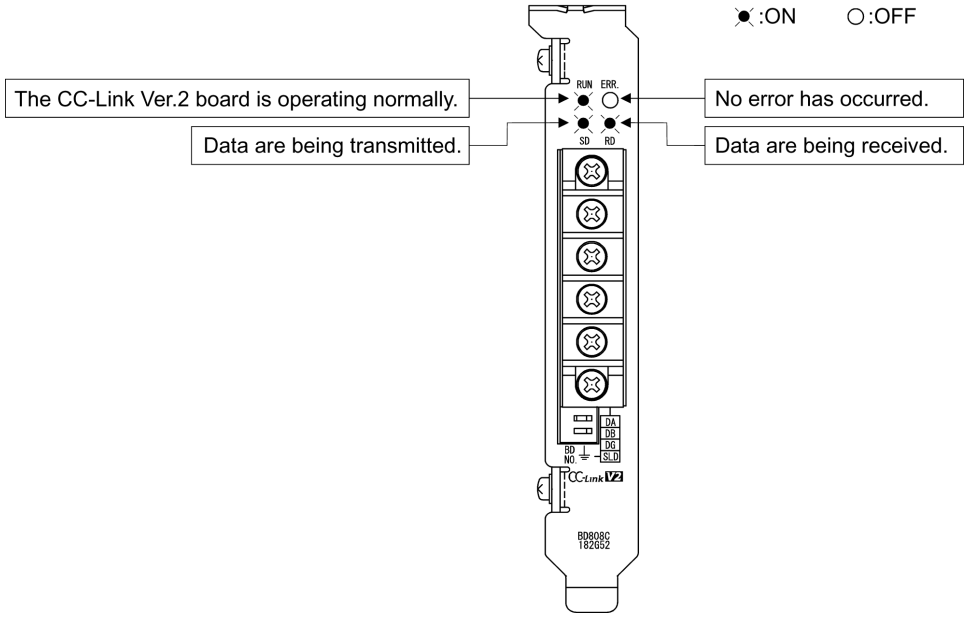
The following describes how to check the operation status of the master station and remote I/O stations under normal data link condition.

(1) Checking the master station

Check the operation status of the master station.

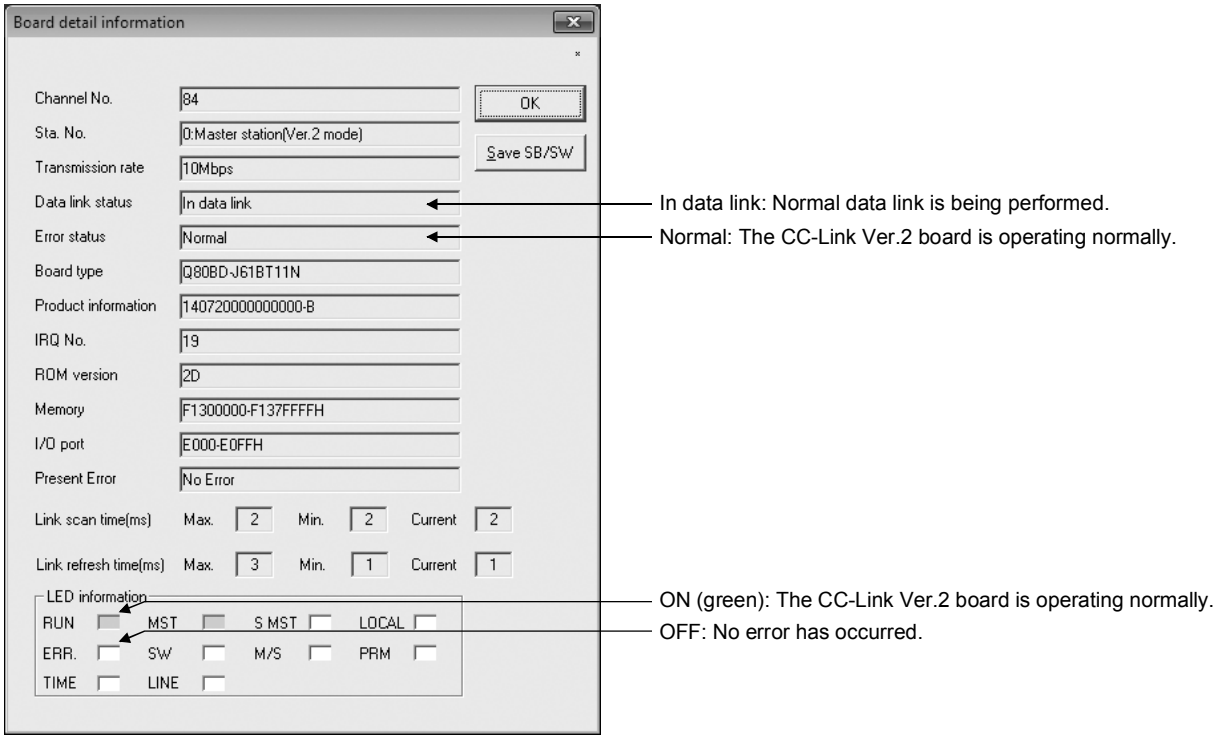
(a) Checking by the LED indication on the CC-Link Ver.2 board

Make sure that the LED status is as follows:



(b) Checking by the CC-Link Ver.2 Utility

Check that the Board detail information of the CC-Link Ver.2 Utility is displayed as shown below.

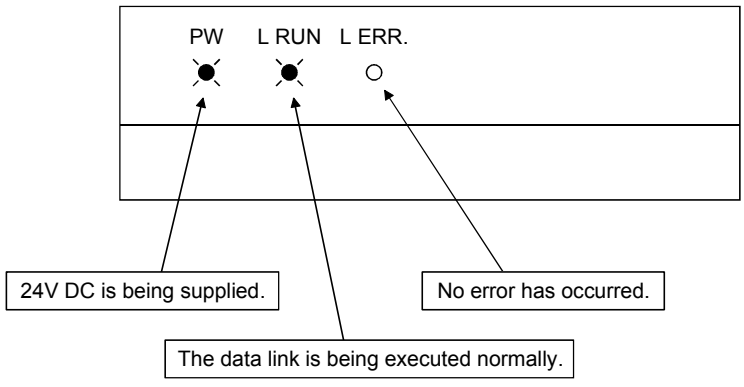

Board detail information
Channel No. 84
Sta. No. 0:Master station(Ver.2 mode)
Transmission rate 10Mbps
Data link status In data link
Error status Normal
Board type Q80BD-J61BT11N
Product information 140720000000000-B
IRQ No. 19
ROM version 2D
Memory F1300000-F137FFFFH
I/O port E000-E0FFH
Present Error No Error
Link scan time(ms) Max. 2 Min. 2 Current 2
Link refresh time(ms) Max. 3 Min. 1 Current 1
LED information
RUN MST S MST LOCAL
ERR. SW M/S PRM
TIME LINE
OK
Save SB/SW
In data link: Normal data link is being performed.
Normal: The CC-Link Ver.2 board is operating normally.
ON (green): The CC-Link Ver.2 board is operating normally.
OFF: No error has occurred.

(2) Checking remote I/O stations.

Be sure that the LED display shows the following status:

AJ65SBTC1-32D1
AJ65SBTC1-32T

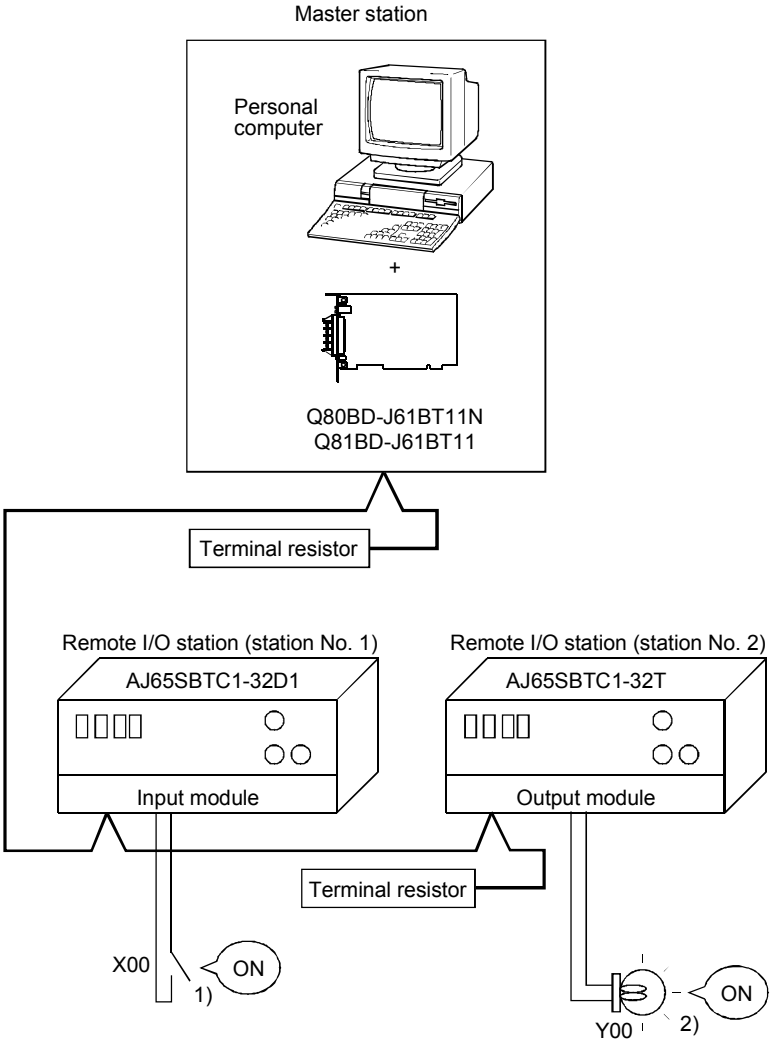
● : On ○ : Off



10.5.2 Confirming the operation with a user program

Using a user program, confirm that the data link is being executed normally.
Use of the sample program allows the operation check in the following system configuration.
For details on the location where the sample program is stored, refer to MELSEC Data Link Library Reference Manual.
With the sample program, the following operations can be checked:

When the input X0 (RX0) in 1) is turned on, the output Y0 (RY20) in 2) turns on.
When the input X0 (RX0) in 1) is turned off, the output Y0 (RY20) in 2) turns off.



11 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE DEVICE STATION

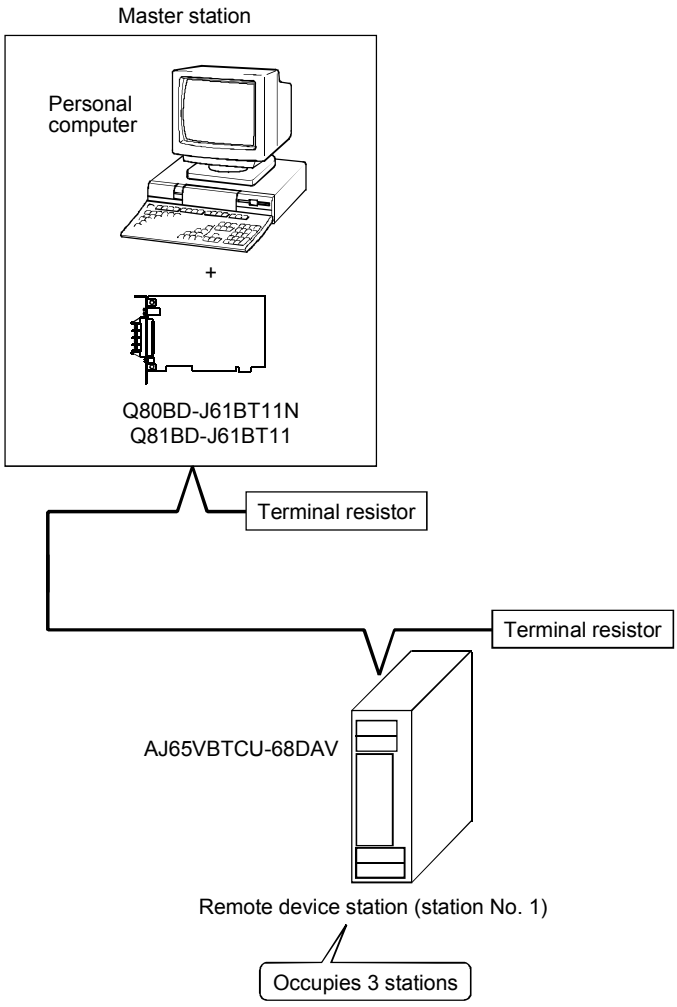
This section gives a system configuration example to explain the CC-Link Ver.2 board and remote device station setting, parameter setting, programming and operation check.
For details on remote device stations, refer to the User's Manual for the remote device station.

11.1 When Using the Remote Net Ver.1 Mode

The following describes communications in the remote net Ver.1 mode.

11.1.1 Configuring a System

In this example, a system consisting of a master station and only one remote I/O station as shown below is used.



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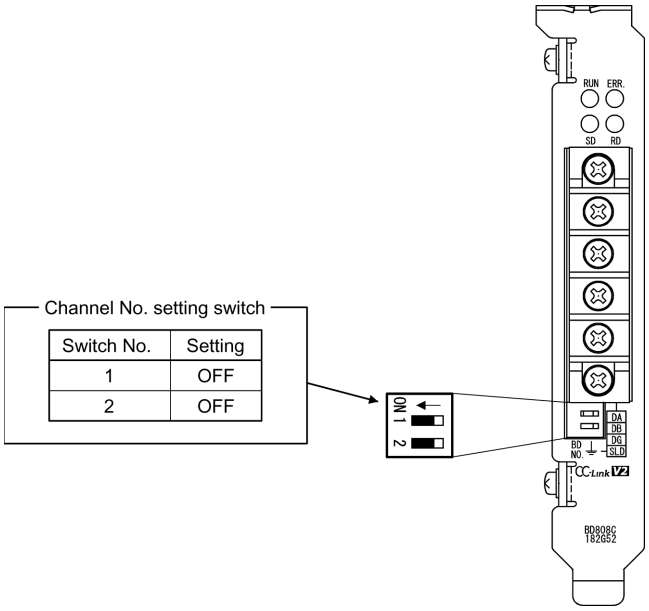
11.1.2 Setting the master station

The following shows the master station setting.

(1) Switch setting (channel No. setting)

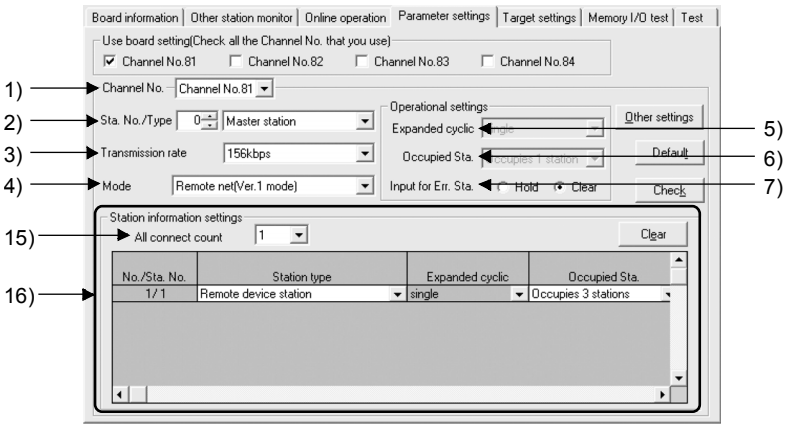
The channel No. for the CC-Link Ver.2 board is set to 81 as an example in this section.



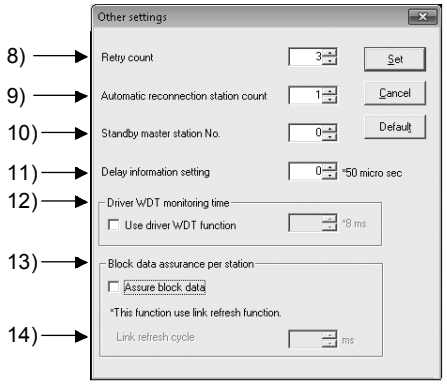
(2) Parameter settings

The following shows the master station's parameter settings by the CC-Link Ver.2 Utility.

<Parameter settings screen>



<Other settings screen>



(a) Parameter settings

The following shows the parameter setting values. The parameter setting check list and the station information setting check list in Appendix can be used for the setting.

Table 11.1 Parameter Setting Check List

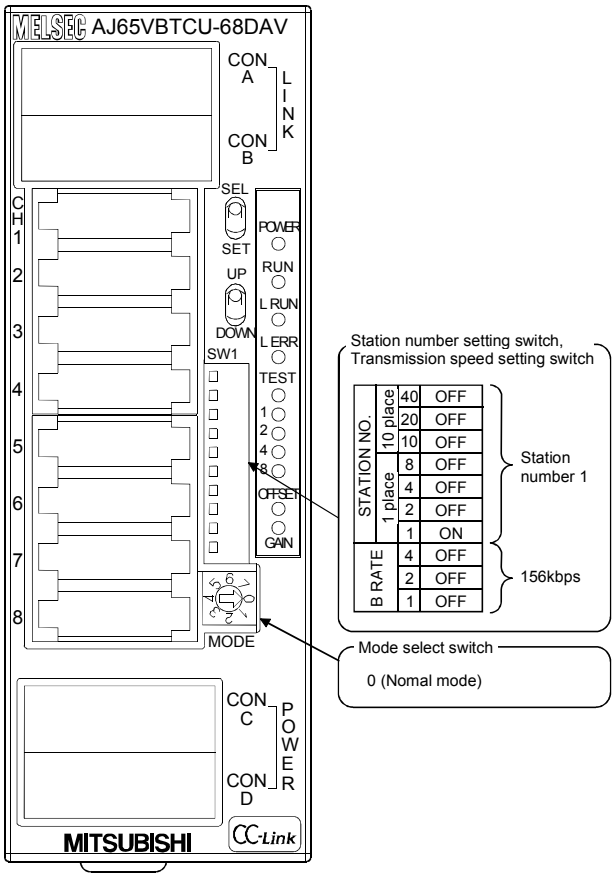
Setting item		Setting range/Item	
1) Channel No.		Channel No. 81 / Channel No.82 Channel No. 83 / Channel No.84	
2) Sta. No./Type		No.0	Master station / Local station / Standby master station
3) Transmission rate		156kbps / 625kbps / 2.5Mbps / 5Mbps / 10Mbps	
4) Mode		Remote net [Ver.1 mode] / Remote net [Ver.2 mode] Remote net [Additional mode] / Off line	
Operational settings	5) Expanded cyclic	single / double / quadruple / octuple	
	6) Occupied Sta.	Occupies 1 station / Occupies 2 stations Occupies 3 stations / Occupies 4 stations	
	7) Input for Err. Sta.	Hold / Clear	
Other settings	8) Retry count	3 Times	
	9) Automatic reconnection station count	1 Modules	
	10) Standby master station No.	No.0	
	11) Delay information setting	0 × 50 micro sec	
	12) Driver WDT Monitoring Time	No setting / × 8 ms	
	13) Block data assurance per station	Disable / Enable	
	14) Link refresh cycle	No setting / ms	
Station information settings	15) All connect count	1 Modules	

Table 11.2 Station Information Setting Check List

Sta. No.	Station type	Expanded cyclic	Occupied Sta.	Remote station points	Reserve/invalid station select	Intelligent buffer select (word)		
						Send	Receive	Automatic
16) 1	Remote device station	single	Occupies 3 stations	96 points	No setting			
2								
3								

11.1.3 Setting up the remote device station

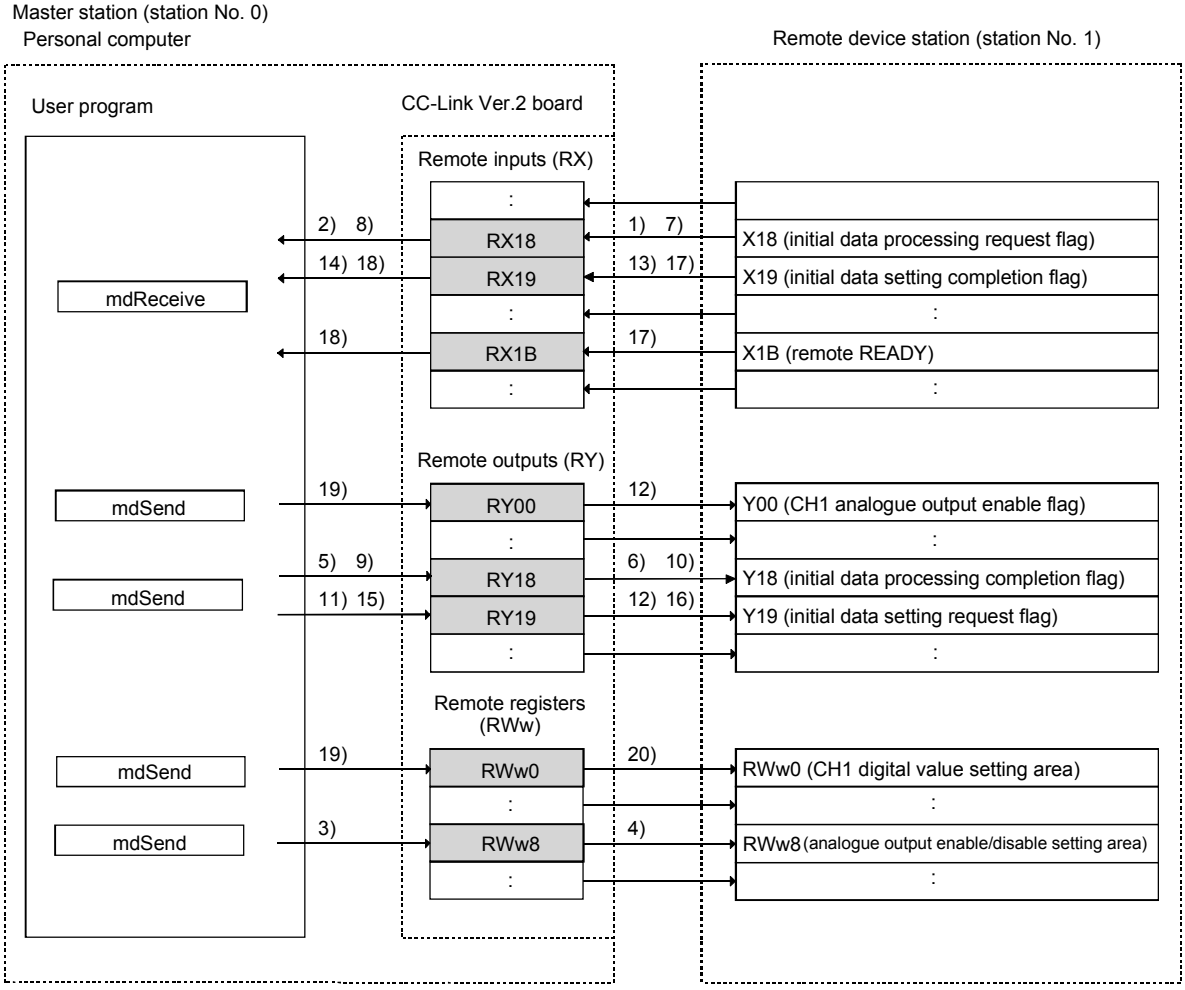
The following shows the remote device station's switch settings.



11.1.4 Creating a Program

Create the digital value setting program for performing the initial setting and outputting analog values for remote device stations.
The following illustrates the relation between the remote device station's I/O operations and the user program when controlling the remote device station, and how the digital value settings for the initial setting and analog outputs controls the system.
(The shaded areas indicate the devices that are actually used.)

*: Default values are used for the initial settings except the analog output enable/disable setting.



User Program		CC-Link Ver.2 Board
2) Reads out the initial data processing request flag (RX18).	←	1) Turns ON the initial data processing request flag (RX18) on the AJ65VBTCU-68DAV after turning on the AJ65VBTCU-68DAV.
3) With the initial data processing request flag (RX18) ON, writes data to the analog output enable/disable setting area (RWw8).	→	4) Writes data to the analog output enable/disable setting area (RWw8) on the AJ65VBTCU-68DAV.
5) Turns ON the initial data processing completion flag (RY18).	→	6) Turns ON the initial data processing completion flag (RY18) on the AJ65VBTCU-68DAV.
8) Reads out the initial data processing request flag (RX18).	←	7) The initial data processing request flag (RX18) is turned OFF on the AJ65VBTCU-68DAV.
9) With the initial data processing request flag (RX18) OFF, turns OFF the initial data processing completion flag (RY18).	→	10) Turns OFF the initial data processing completion flag (RY18) on the AJ65VBTCU-68DAV.
11) Turns ON the initial data setting request flag (RY19).	→	12) Turns ON the initial data setting request flag (RY19) on the AJ65VBTCU-68DAV.
14) Reads out the initial data setting completion flag (RX19).	←	13) The initial data setting completion flag (RX19) on the AJ65VBTCU-68DAV is turned ON.
15) With the initial data setting completion flag (RX19) ON, turns OFF the initial data setting request flag (RY19).	→	16) Turns OFF the initial data setting request flag (RY19) on the AJ65VBTCU-68DAV.
18) Reads out the initial data setting completion flag (RX19) and the remote READY (RX1B).	←	17) The initial data setting completion flag (RX19) on the AJ65VBTCU-68DAV is turned OFF, and the remote READY (RX1B) is turned ON.
19) With the initial data setting completion flag (RX19) OFF and the remote READY (RX1B) ON, perform the following: ・Writing digital values to the CH1 digital value setting area (RWw0). ・Turning ON the analog output enable flag (RY00) of the channel.	→	20) Writes digital values to the CH1 digital value setting area (RWw0) on the AJ65VBTCU-68DAV. Analog values are output from the AJ65VBTCU-68DAV.

11.1.5 Executing the data link

Turn ON the remote device stations and the master station in this order, and then start the data link.

(1) Checking the data link status

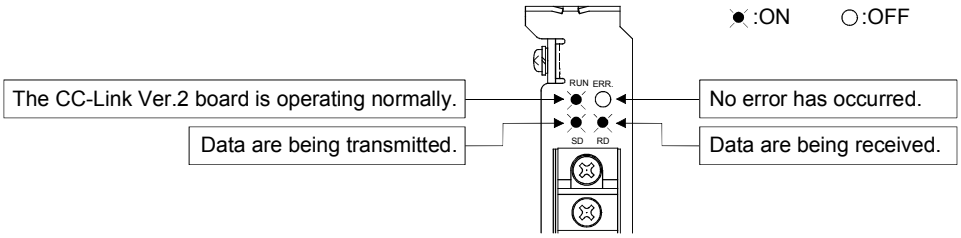
The following describes how to check the operation status of the master station and remote device stations under normal data link condition.

(a) Checking the master station

Check the status of the master station.

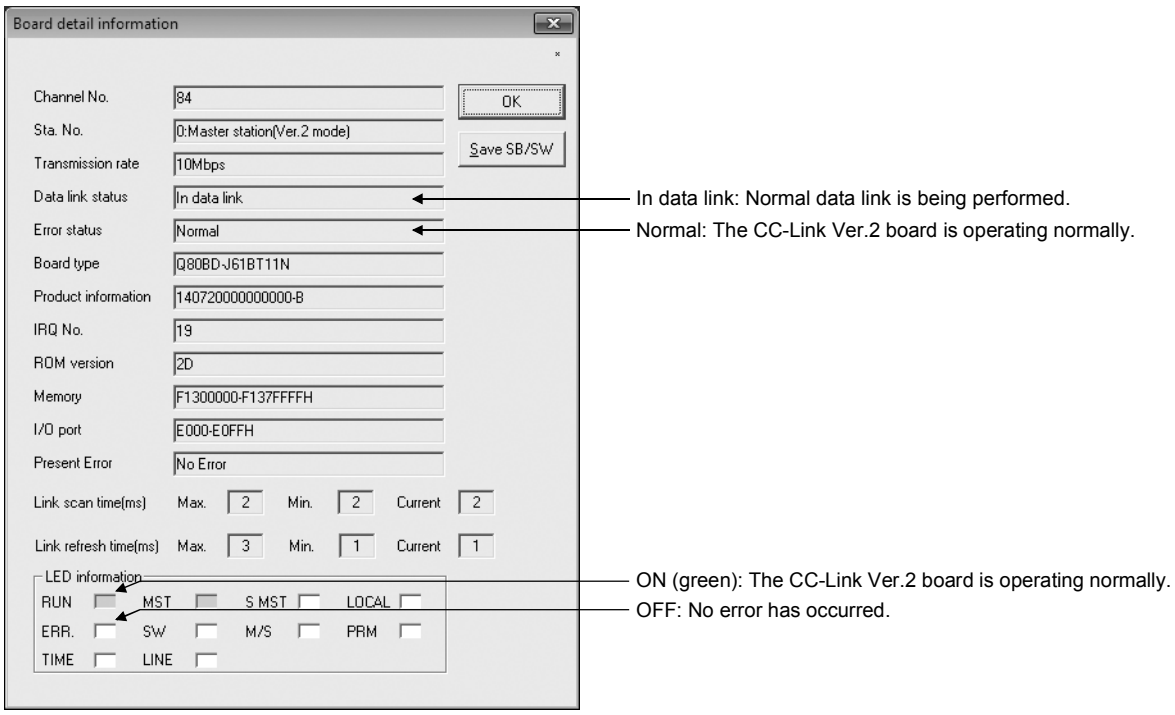
1) Checking by the LED indication on the CC-Link Ver.2 board

Make sure that the LED status is as follows:



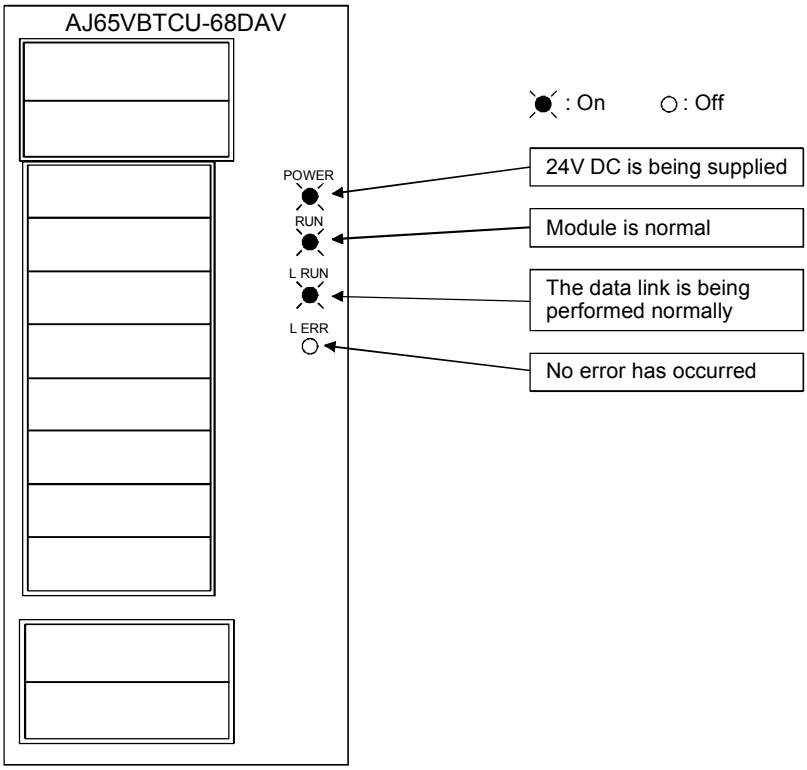
2) Checking by the CC-Link Ver.2 Utility

Check that the Board detail information of the CC-Link Ver.2 Utility is displayed as shown below.


Board detail information
Channel No. 84
Sta. No. 0:Master station(Ver.2 mode)
Transmission rate 10Mbps
Data link status In data link
Error status Normal
Board type Q80BD-J61BT11N
Product information 140720000000000-B
IRQ No. 19
ROM version 2D
Memory F1300000-F137FFFFH
I/O port E000-E0FFH
Present Error No Error
Link scan time(ms) Max. 2 Min. 2 Current 2
Link refresh time(ms) Max. 3 Min. 1 Current 1
LED information
RUN MST S MST LOCAL
ERR. SW M/S PRM
TIME LINE
OK
Save SB/SW
In data link: Normal data link is being performed.
Normal: The CC-Link Ver.2 board is operating normally.
ON (green): The CC-Link Ver.2 board is operating normally.
OFF: No error has occurred.

(b) Checking remote device stations

Check that the LED status are as shown below.



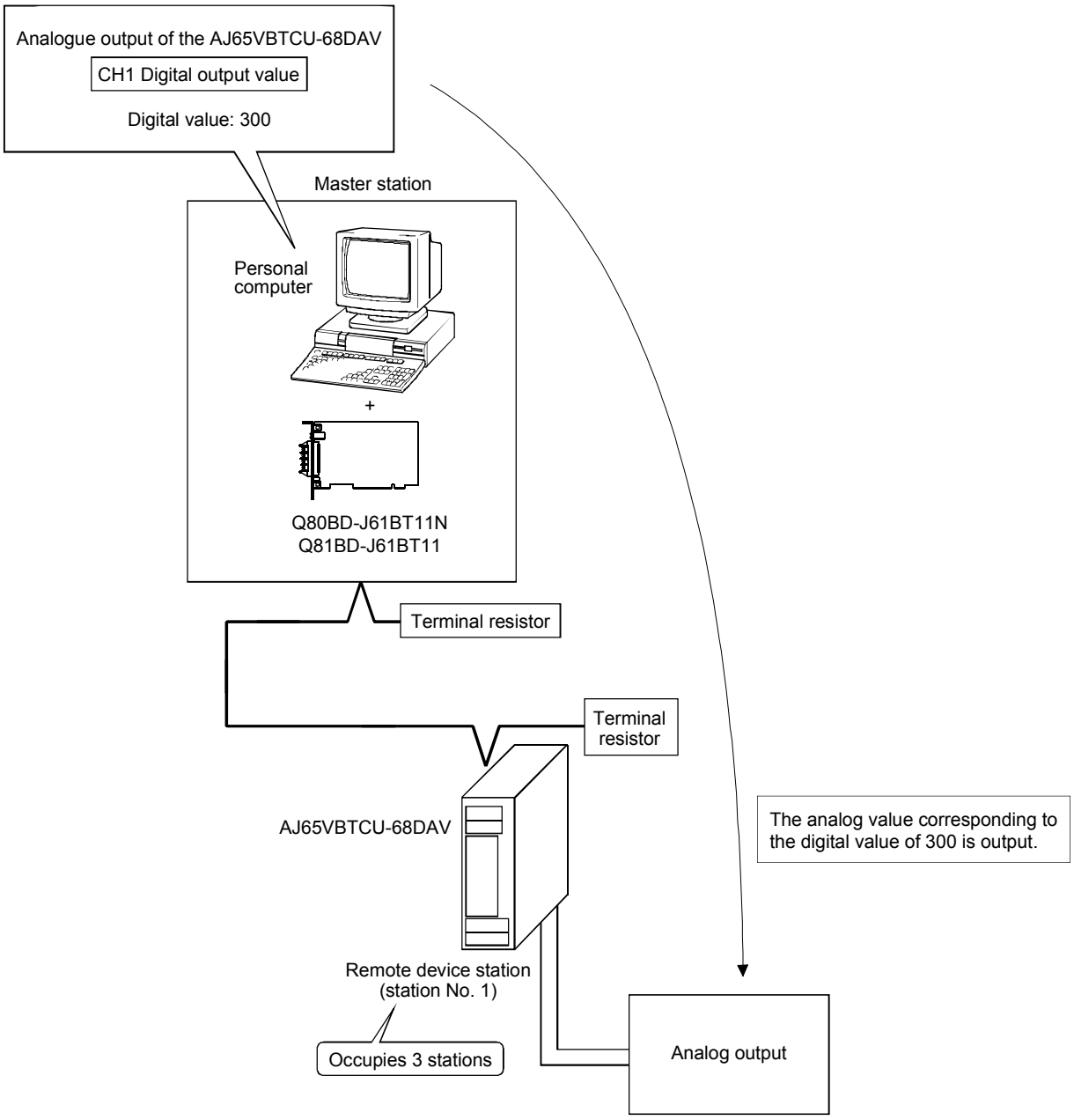
(2) Confirming the operation with a user program

With the user program, check whether digital values are being output to remote device stations through normal data link.

Use of the sample program allows the operation check in the following system configuration.

For details on the location where the sample program is stored, refer to MELSEC Data Link Library Reference Manual.

On the sample program, setting a digital value of "300" enables analog voltages to be output from remote device stations.

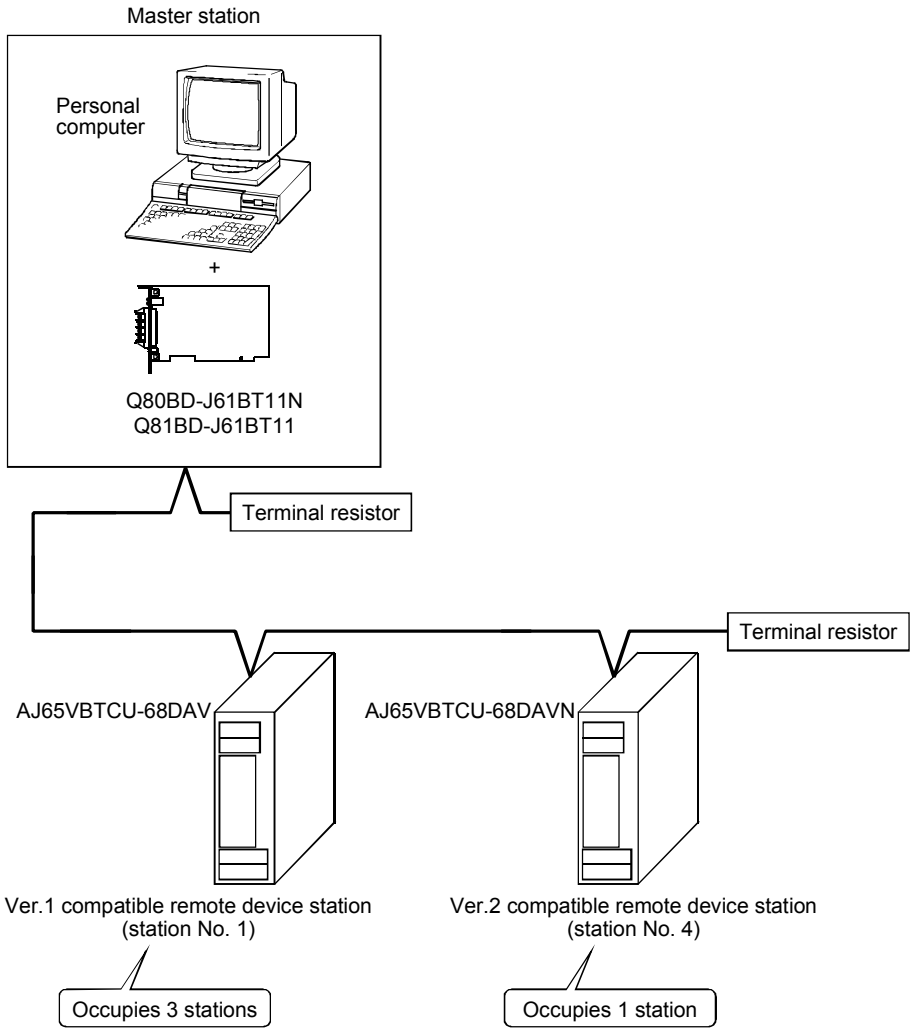


11.2 When Using the Remote Net Ver.2 Mode or Remote Net Additional Mode

The following describes communications in the remote net Ver.2 mode or in the remote net additional mode.

11.2.1 Configuring the system

In this system, 2 remote device stations shall be connected.

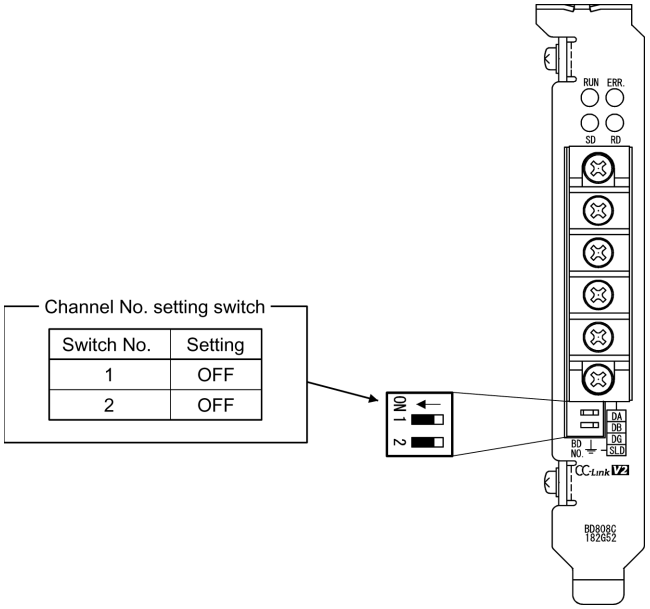


11.2.2 Setting the master station

The following shows the master station setting.

(1) Switch setting (channel No. setting)

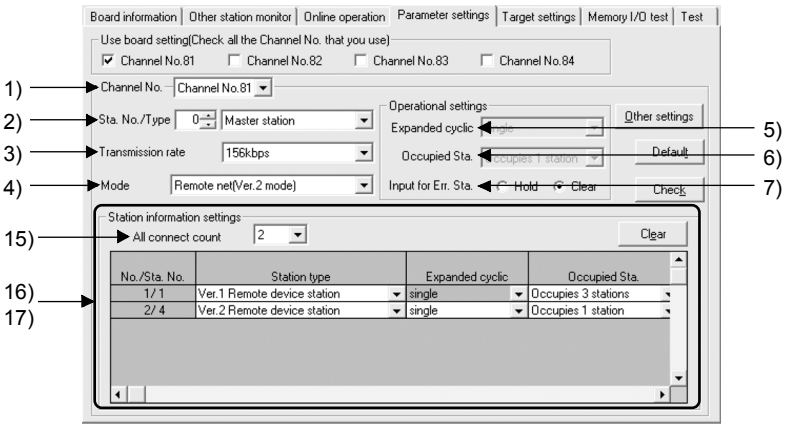
The channel No. for the CC-Link Ver.2 board is set to 81 as an example in this section.



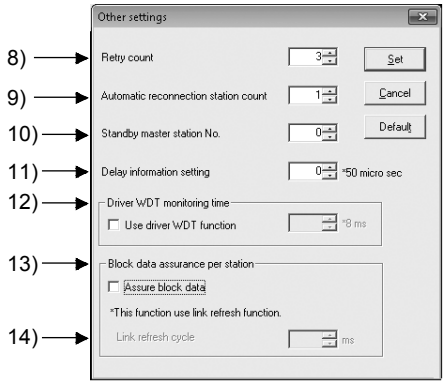
(2) Parameter settings

The following shows the master station's parameter settings by the CC-Link Ver.2 Utility.

<Parameter settings screen>



<Other settings screen>



(a) Parameter settings

The following shows the parameter setting values. The parameter setting check list and the station information setting check list in Appendix can be used for the setting.

Table 11.3 Parameter Setting Check List

Setting item		Setting range/Item
1) Channel No.		(Channel No. 81) / Channel No.82 Channel No. 83 / Channel No.84
2) Sta. No./Type		No.0 (Master station) / Local station / Standby master station
3) Transmission rate		(156kbps) / 625kbps / 2.5Mbps / 5Mbps / 10Mbps
4) Mode		Remote net [Ver.1 mode] / (Remote net [Ver.2 mode]) Remote net [Additional mode] / Off line
Operational settings	5) Expanded cyclic	single / double / quadruple / octuple
	6) Occupied Sta.	Occupies 1 station / Occupies 2 stations Occupies 3 stations / Occupies 4 stations
	7) Input for Err. Sta.	Hold / (Clear)
Other settings	8) Retry count	3 Times
	9) Automatic reconnection station count	1 Modules
	10) Standby master station No.	No.0
	11) Delay information setting	0 × 50 micro sec
	12) Driver WDT Monitoring Time	(No setting) / × 8 ms
	13) Block data assurance per station	(Disable) / Enable
	14) Link refresh cycle	(No setting) / ms
Station information settings	15) All connect count	2 Modules

*1: To set the CC-Link system to the remote net Additional mode, select "Remote net Additional mode."

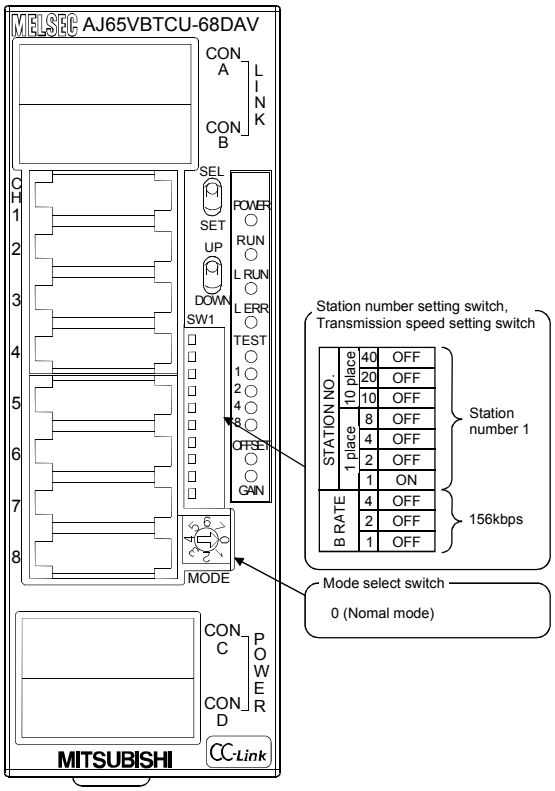
Table 11.4 Station Information Setting Check List

Sta. No.	Station type	Expanded cyclic	Occupied Sta.	Remote station points	Reserve/invalid station select	Intelligent buffer select (word)		
						Send	Receive	Automatic
16) 1	Ver.1 Remote device station	single	Occupies 3 stations	96 points	No setting			
17) 4	Ver.2 Remote device station	quadruple	Occupies 1 station	64 points	No setting			

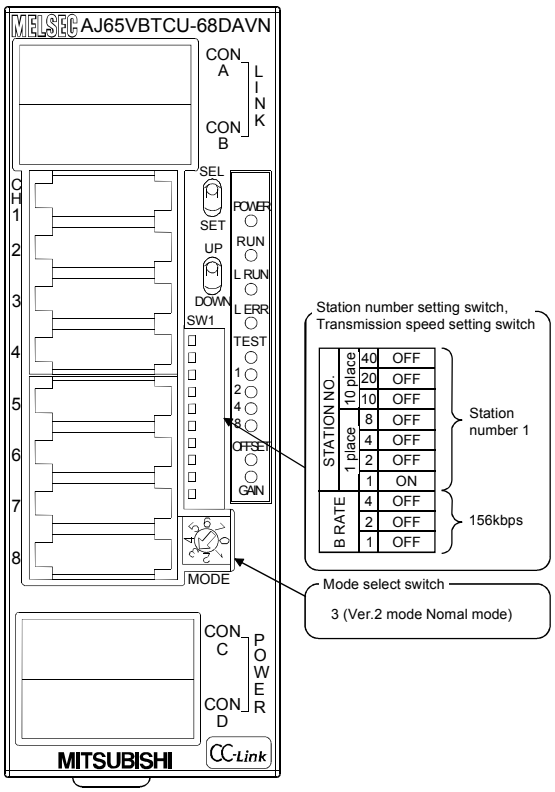
11.2.3 Setting the remote device station

The following shows the remote device station switch settings.

AJ65VBTCU-68DAV



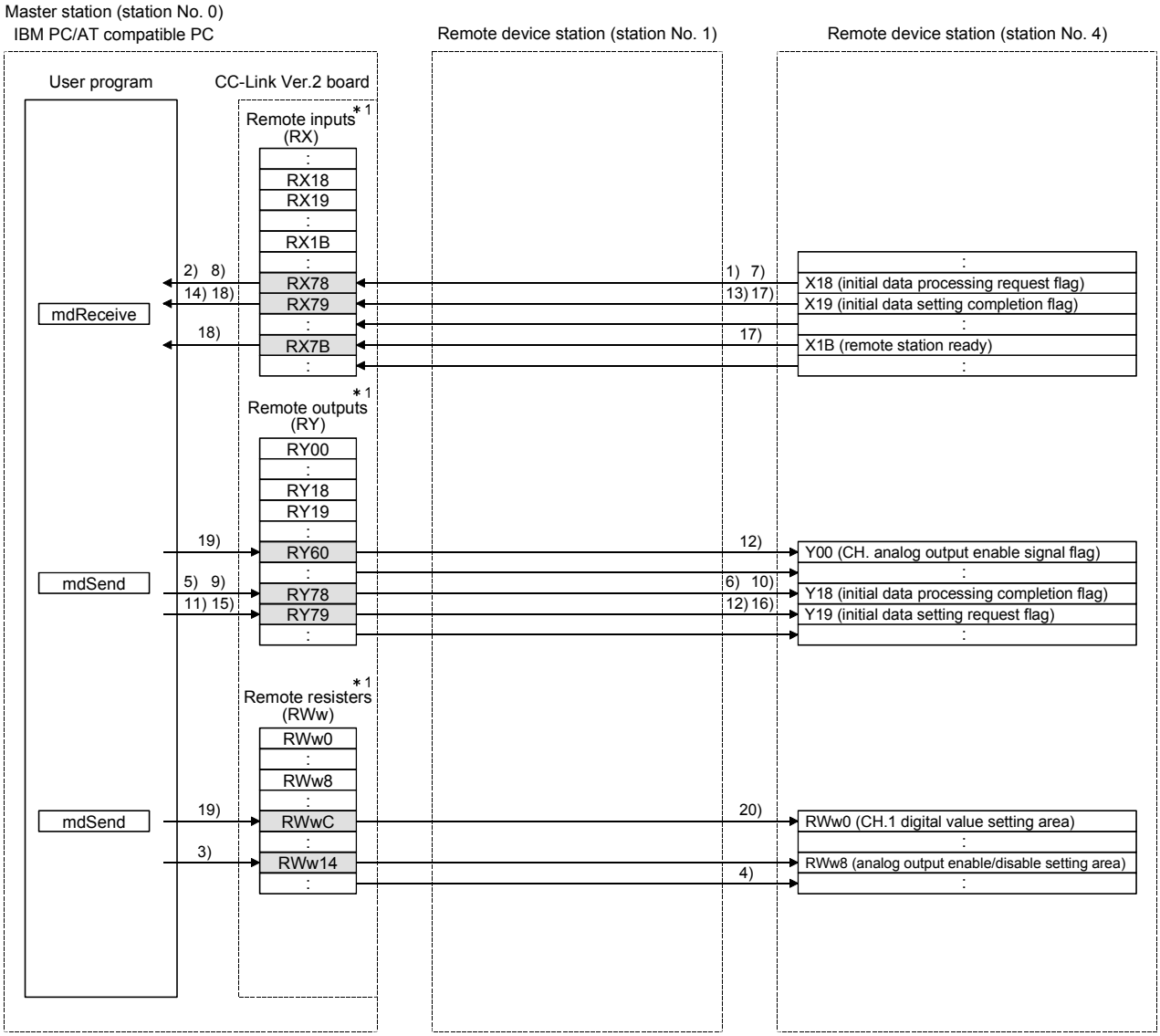
AJ65VBTCU-68DAVN



11.2.4 Creating a program

Create the digital value setting program for performing the initial setting and outputting analog values for remote device stations of station No.4*1.
The programming procedure for station No.4*1 is the same as the one used in the remote net Ver.1 mode.
Refer to Section 11.1.4.

*1: For the remote device station of station No.4, device Nos. of the remote input (RX) and remote output (RY) and addresses of the remote register (RWr, RWw) are changed.



11.2.5 Executing the data link

Turn ON the remote device stations and the master station in this order, and then start the data link.

(1) Checking the data link status

The following describes how to check the operation status of the master station and remote device stations under normal data link condition.

(a) Checking the master station

How to check the master station is the same as in the remote net Ver.1 mode.

Refer to Section 11.1.5 (1) (a).

(b) Checking remote device stations

How to check the remote device stations is the same as in the remote net Ver.1 mode.

Refer to Section 11.1.5 (1) (b).

For the AJ65VBTCU-68DAVN, check the identical location as the LEDs on the AJ65VBTCU-68DAV.

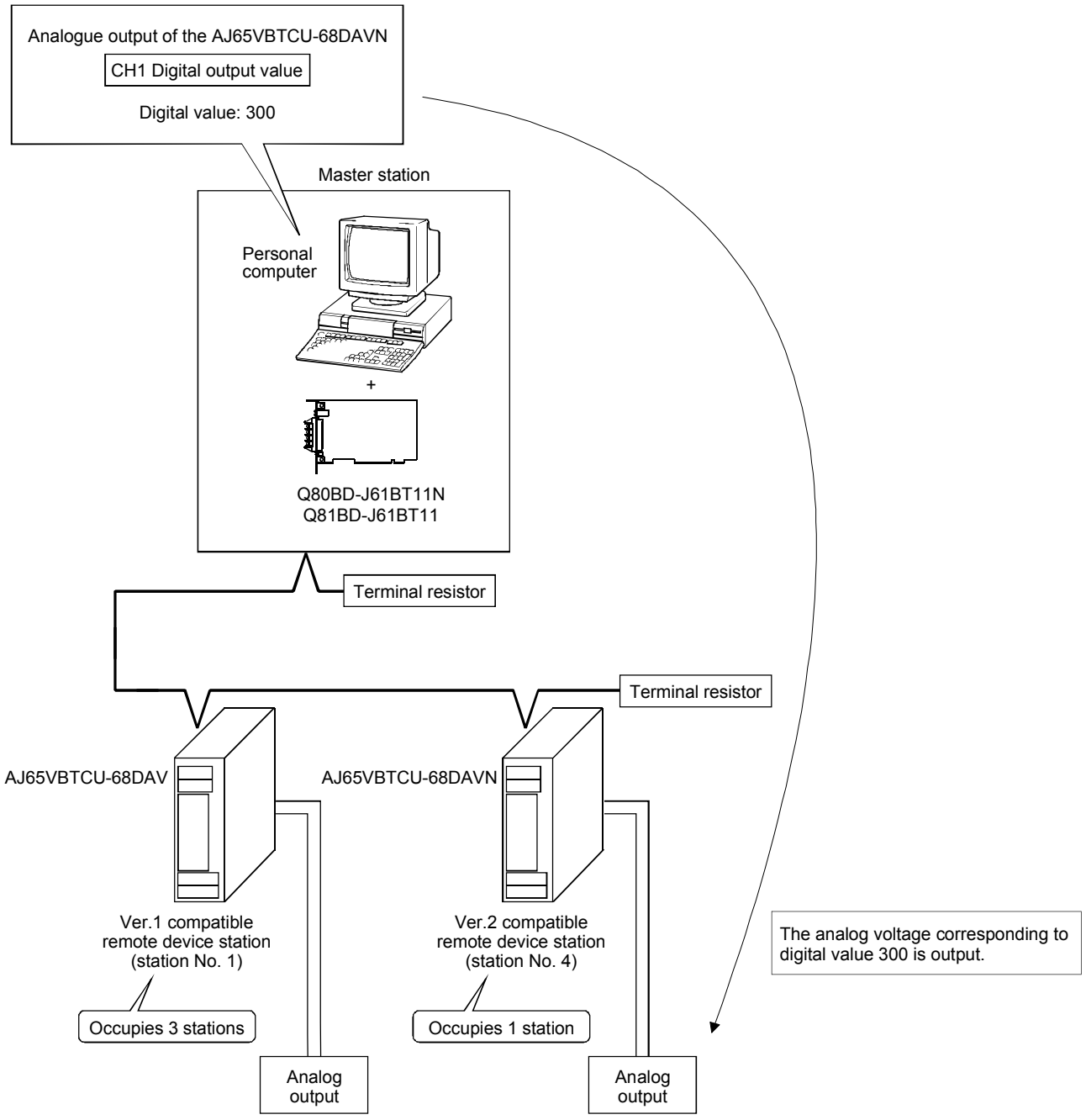
(2) Confirming the operation with a user program

With the user program, check whether digital values are being output to remote device stations through normal data link.

Use of the sample program allows the operation check in the following system configuration.

For details on the location where the sample program is stored, refer to MELSEC Data Link Library Reference Manual.

On the sample program, setting a digital value of "300" enables analog voltages to be output from remote device stations.



12 COMMUNICATION BETWEEN THE MASTER STATION AND LOCAL STATIONS

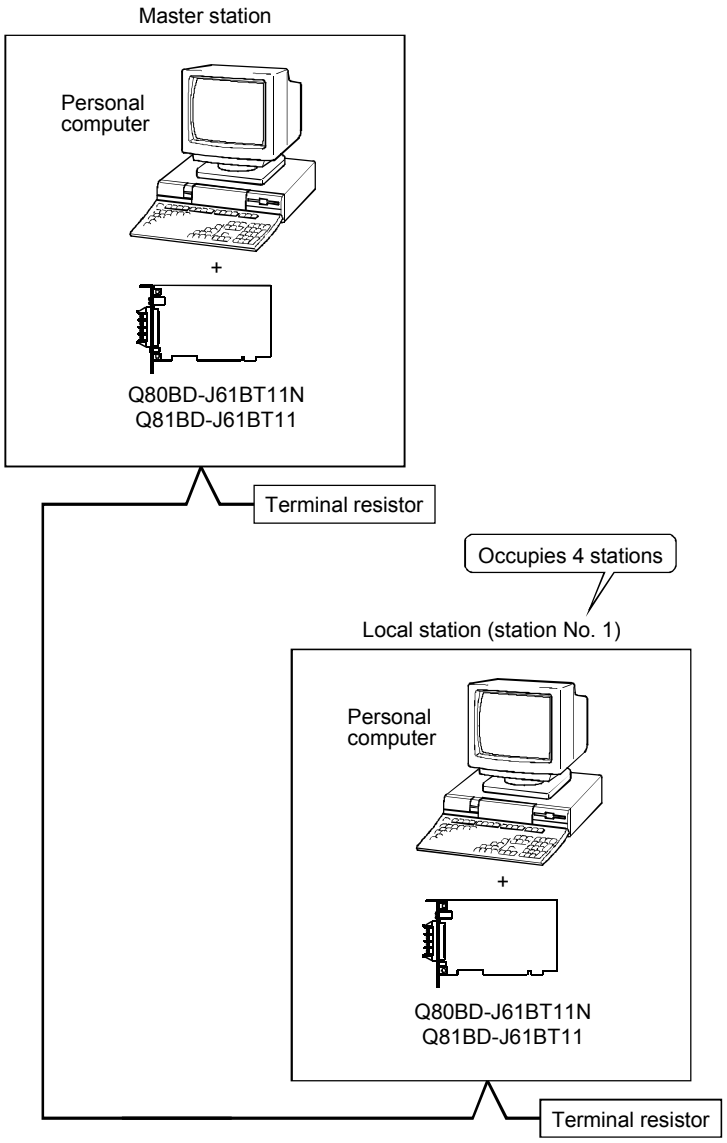
This section gives a system configuration example to explain the CC-Link Ver.2 board and local station setting, parameter setting, programming and operation check.

12.1 When Using the Remote Net Ver.1 Mode

The following describes communications in the remote net Ver.1 mode.

12.1.1 Configuring the system

In this system, one local station shall be connected.



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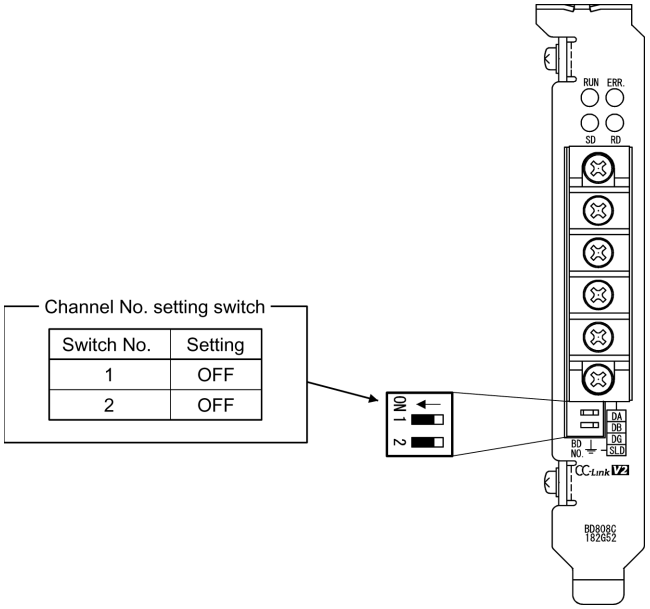
12.1.2 Setting the master station

The following shows the master station setting.

(1) Switch setting (channel No. setting)

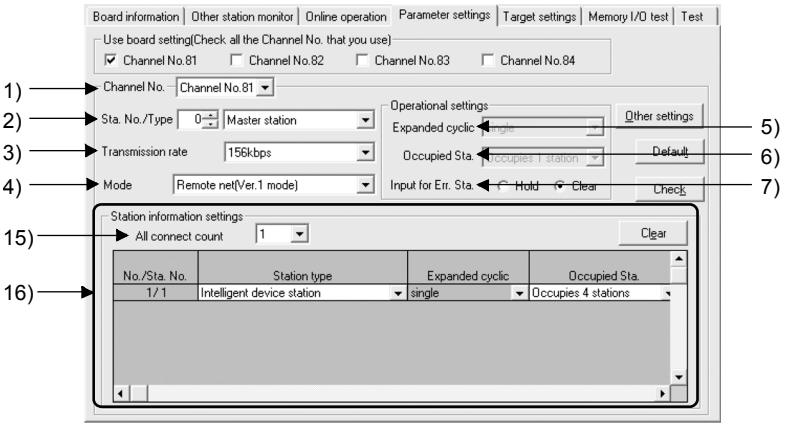
The channel No. for the CC-Link Ver.2 board is set to 81 as an example in this section.



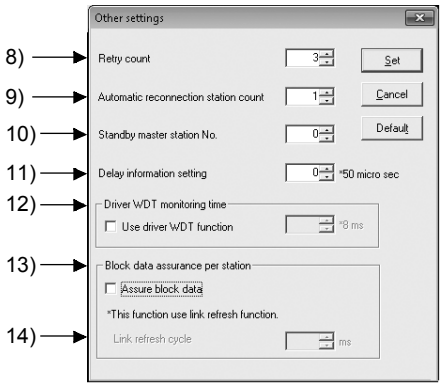
(2) Parameter settings

The following shows the master station's parameter settings by the CC-Link Ver.2 Utility.

<Parameter settings screen>



<Other settings screen>



(a) Parameter settings

The following shows the parameter setting values. The parameter setting check list and the station information setting check list in Appendix can be used for the setting.

Table 12.1 Parameter Setting Check List

Setting item		Setting range/Item
1) Channel No.		Channel No. 81 / Channel No.82 Channel No. 83 / Channel No.84
2) Sta. No./Type		No.0 Master station / Local station / Standby master station
3) Transmission rate		156kbps / 625kbps / 2.5Mbps / 5Mbps / 10Mbps
4) Mode		Remote net [Ver.1 mode] / Remote net [Ver.2 mode] Remote net [Additional mode] / Off line
Operational settings	5) Expanded cyclic	single / double / quadruple / octuple
	6) Occupied Sta.	Occupies 1 station / Occupies 2 stations Occupies 3 stations / Occupies 4 stations
	7) Input for Err. Sta.	Hold / Clear
Other settings	8) Retry count	3 Times
	9) Automatic reconnection station count	1 Modules
	10) Standby master station No.	No.0
	11) Delay information setting	0 × 50 micro sec
	12) Driver WDT Monitoring Time	No setting / × 8 ms
	13) Block data assurance per station	Disable / Enable
	14) Link refresh cycle	No setting / ms
Station information settings	15) All connect count	1 Modules

Table 12.2 Station Information Setting Check List

Sta. No.	Station type	Expanded cyclic	Occupied Sta.	Remote station points	Reserve/invalid station select	Intelligent buffer select (word)		
						Send	Receive	Automatic
16) 1	Intelligent device station ＊1	single	Occupies 4 stations	128 points	No setting	64	64	128
2								
3								

＊1: For the local station, select an intelligent device station.

12.1.3 Setting the local station

The following shows the local station setting.

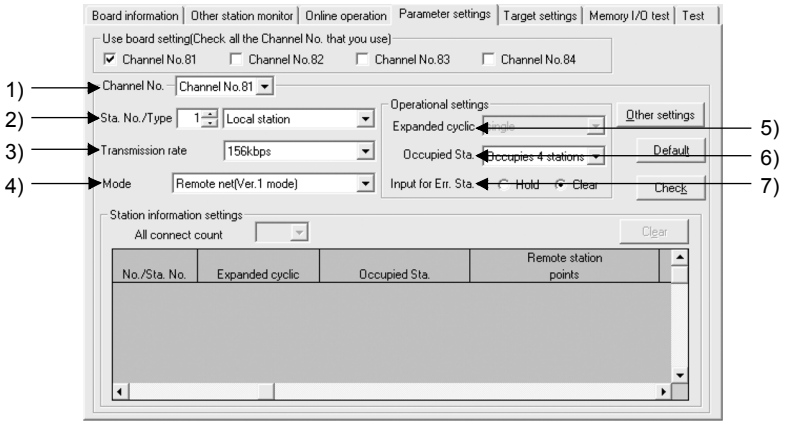
(1) Switch setting (channel No. setting)

The channel No. for the CC-Link Ver.2 board is set to 81 as an example in this section.
For the setting, refer to Section 12.1.2 (1).

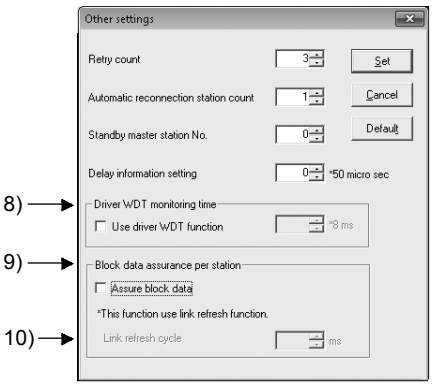
(2) Parameter settings

The following shows the local station's parameter settings by the CC-Link Ver.2 Utility.

<Parameter settings screen>



<Other settings screen>



(a) Parameter settings

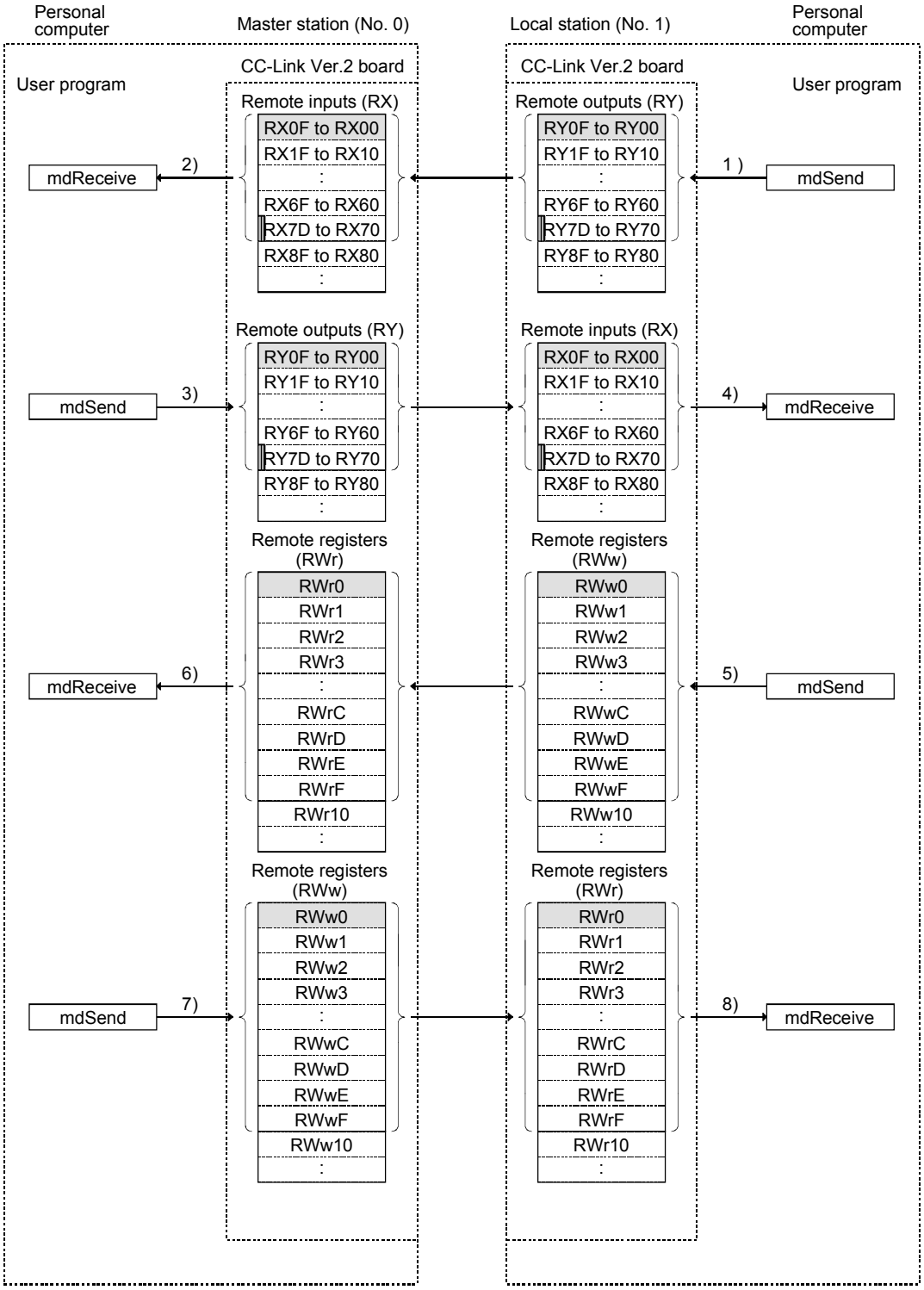
The following shows the parameter setting values. The parameter setting check list and the station information setting check list in Appendix can be used for the setting.

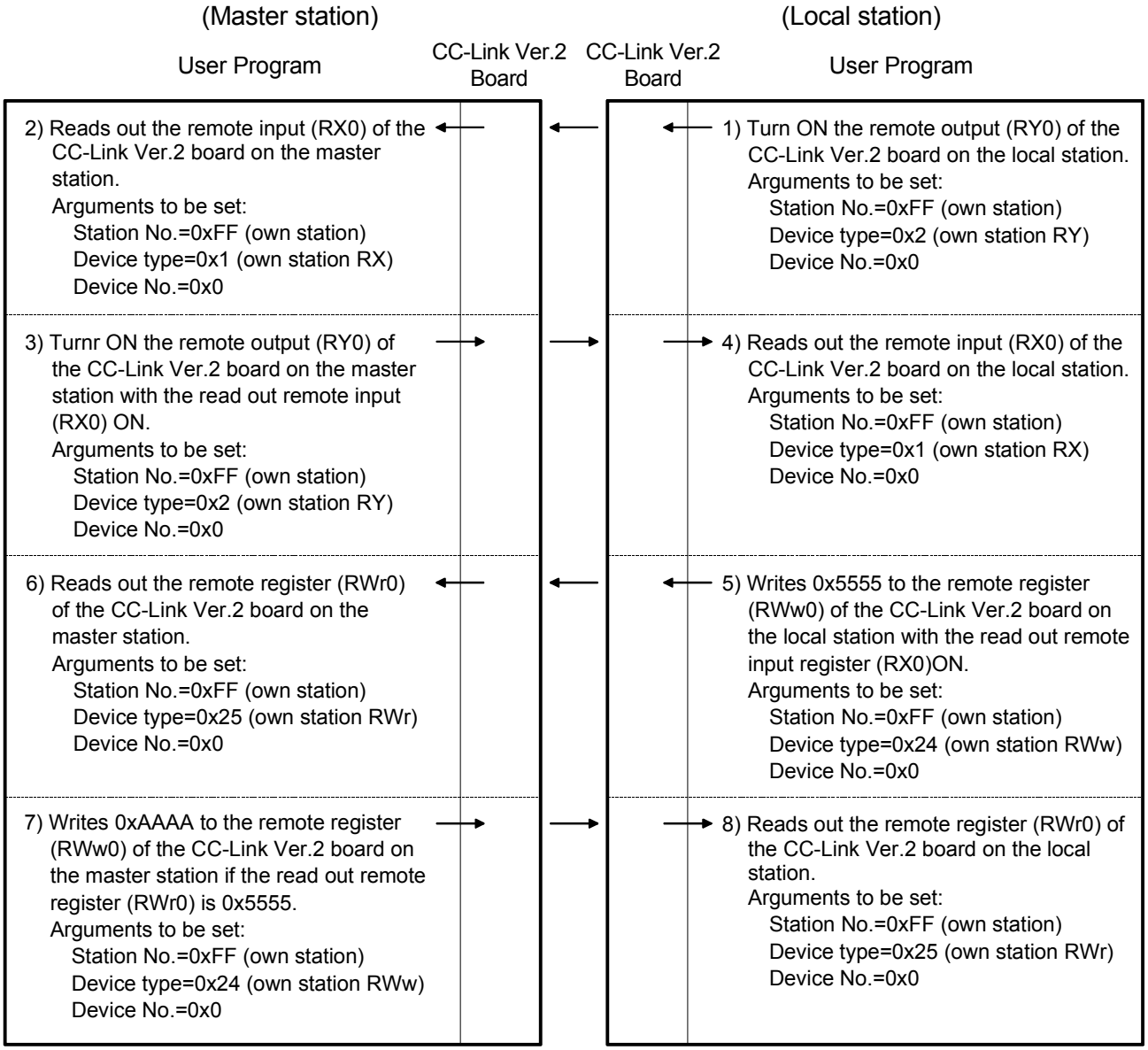
Table 12.3 Parameter Setting Check List

Setting item		Setting range/Item
1) Channel No.		Channel No. 81 / Channel No.82 Channel No. 83 / Channel No.84
2) Sta. No./Type		No.1: Master station / Local station / Standby master station
3) Transmission rate		156kbps / 625kbps / 2.5Mbps / 5Mbps / 10Mbps
4) Mode		Remote net [Ver.1 mode] / Remote net [Ver.2 mode] Remote net [Additional mode] / Off line
Operational settings	5) Expanded cyclic	single / double / quadruple / octuple
	6) Occupied Sta.	Occupies 1 station / Occupies 2 stations Occupies 3 stations / Occupies 4 stations
	7) Input for Err. Sta.	Hold / Clear
Other settings	Retry count	3 Times
	Automatic reconnection station count	1 Modules
	Standby master station No.	No.0
	Delay information setting	0 × 50 micro sec
	8) Driver WDT Monitoring Time	No setting / × 8 ms
	9) Block data assurance per station	Disable / Enable
	10) Link refresh cycle	No setting / ms
Station information settings	All connect count	Modules

12.1.4 Creating a program

Create the program for reading the remote input (RX), writing the remote output (RY), reading the remote registers (RWr) and writing remote registers (RWw) from/to the local station.
The following illustrates the relation between the I/O operations and the user program when sending/receiving data between the master station and local station.
(The shaded areas indicate the devices that are actually used.)




(Master station)
(Local station)
User Program
CC-Link Ver.2 Board
CC-Link Ver.2 Board
User Program
2) Reads out the remote input (RX0) of the CC-Link Ver.2 board on the master station.
Arguments to be set:
Station No.=0xFF (own station)
Device type=0x1 (own station RX)
Device No.=0x0
1) Turn ON the remote output (RY0) of the CC-Link Ver.2 board on the local station.
Arguments to be set:
Station No.=0xFF (own station)
Device type=0x2 (own station RY)
Device No.=0x0
3) Turnr ON the remote output (RY0) of the CC-Link Ver.2 board on the master station with the read out remote input (RX0) ON.
Arguments to be set:
Station No.=0xFF (own station)
Device type=0x2 (own station RY)
Device No.=0x0
4) Reads out the remote input (RX0) of the CC-Link Ver.2 board on the local station.
Arguments to be set:
Station No.=0xFF (own station)
Device type=0x1 (own station RX)
Device No.=0x0
6) Reads out the remote register (RWr0) of the CC-Link Ver.2 board on the master station.
Arguments to be set:
Station No.=0xFF (own station)
Device type=0x25 (own station RWr)
Device No.=0x0
5) Writes 0x5555 to the remote register (RWw0) of the CC-Link Ver.2 board on the local station with the read out remote input register (RX0)ON.
Arguments to be set:
Station No.=0xFF (own station)
Device type=0x24 (own station RWw)
Device No.=0x0
7) Writes 0xAAAA to the remote register (RWw0) of the CC-Link Ver.2 board on the master station if the read out remote register (RWr0) is 0x5555.
Arguments to be set:
Station No.=0xFF (own station)
Device type=0x24 (own station RWw)
Device No.=0x0
8) Reads out the remote register (RWr0) of the CC-Link Ver.2 board on the local station.
Arguments to be set:
Station No.=0xFF (own station)
Device type=0x25 (own station RWr)
Device No.=0x0

12.1.5 Executing the data link

Turn ON the local stations and the master station in this order, and then start the data link.

(1) Checking the data link status

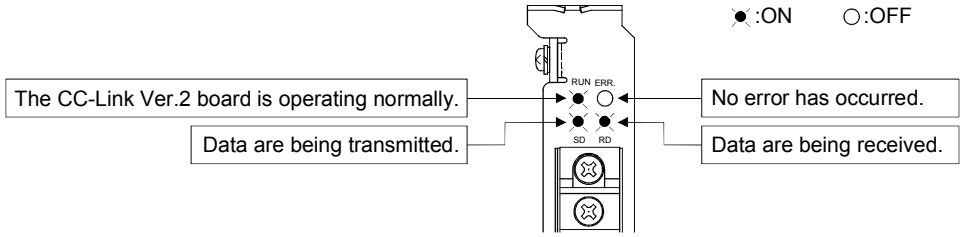
The following describes how to check the operation status of the master station and local stations under normal data link condition.

(a) Checking the master station and local stations

Check the status of the master station and local stations.

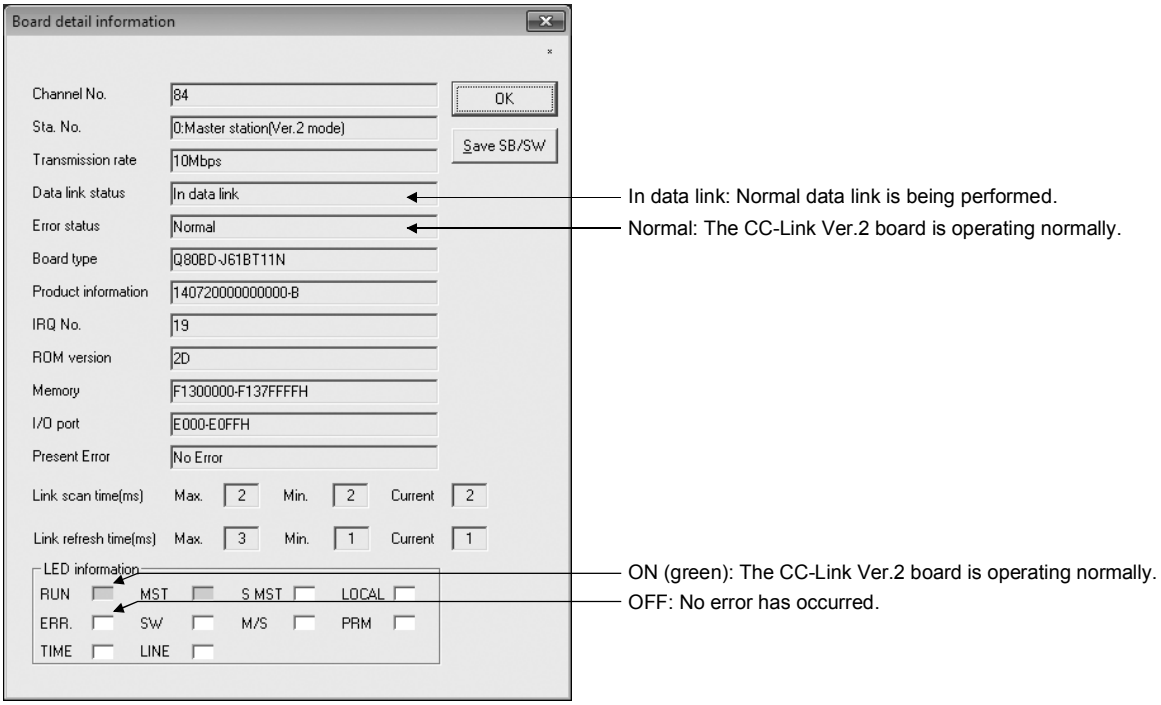
1) Checking by the LED indication on the CC-Link Ver.2 board

Make sure that the LED status is as follows:



2) Checking by the CC-Link Ver.2 Utility

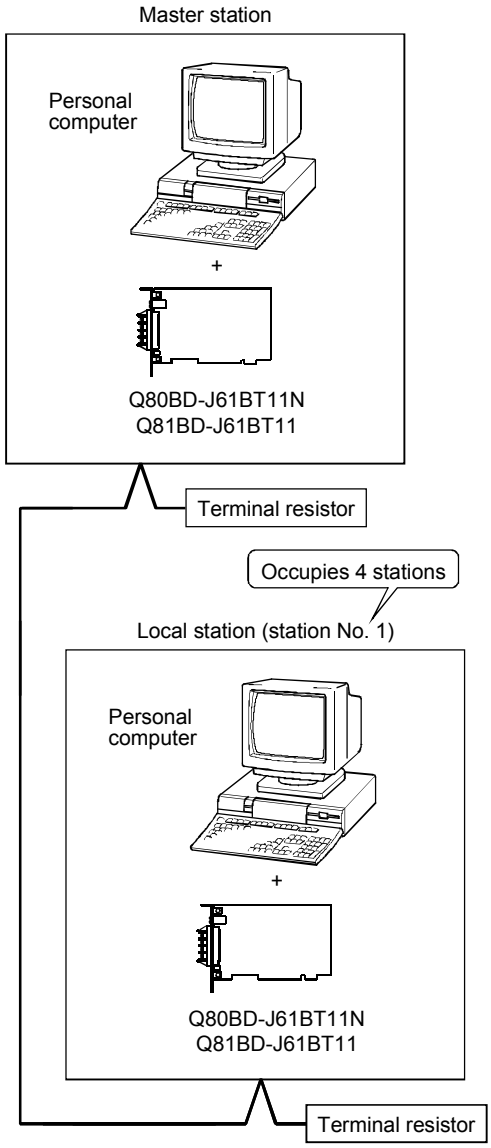
Check that the Board detail information of the CC-Link Ver.2 Utility is displayed as shown below.

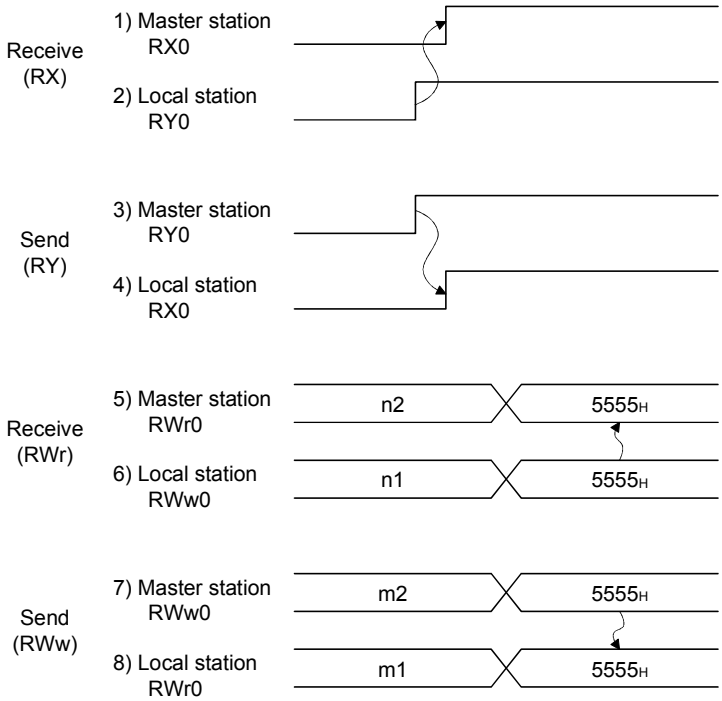

Board detail information
Channel No. 84
Sta. No. 0:Master station(Ver.2 mode)
Transmission rate 10Mbps
Data link status In data link
Error status Normal
Board type Q80BD-J61BT11N
Product information 140720000000000-B
IRQ No. 19
ROM version 2D
Memory F1300000-F137FFFFH
I/O port E000-E0FFH
Present Error No Error
Link scan time(ms) Max. 2 Min. 2 Current 2
Link refresh time(ms) Max. 3 Min. 1 Current 1
LED information
RUN MST S MST LOCAL
ERR. SW M/S PRM
TIME LINE
OK
Save SB/SW
In data link: Normal data link is being performed.
Normal: The CC-Link Ver.2 board is operating normally.
ON (green): The CC-Link Ver.2 board is operating normally.
OFF: No error has occurred.

(2) Confirming the operation with a user program

With the user program, check whether the data link is being performed normally or not by transferring data between the master station and local stations.
Use of the sample program allows the operation check in the following system configuration.
(Execute user program of the local station within 10 minutes after an user program of the master station has been loaded.)

When the remote output (RY0) 2) turns ON, the remote input (RX0) 1) turns ON.
When the remote output (RY0) 3) turns ON, the remote input (RX0) 4) turns ON.
When data are set to the remote register (RWw0) 6), values are written to the remote register (RWr0) 5).
When data are set to the remote register (RWw0) 7), values are written to the remote register (RWr0) 8).



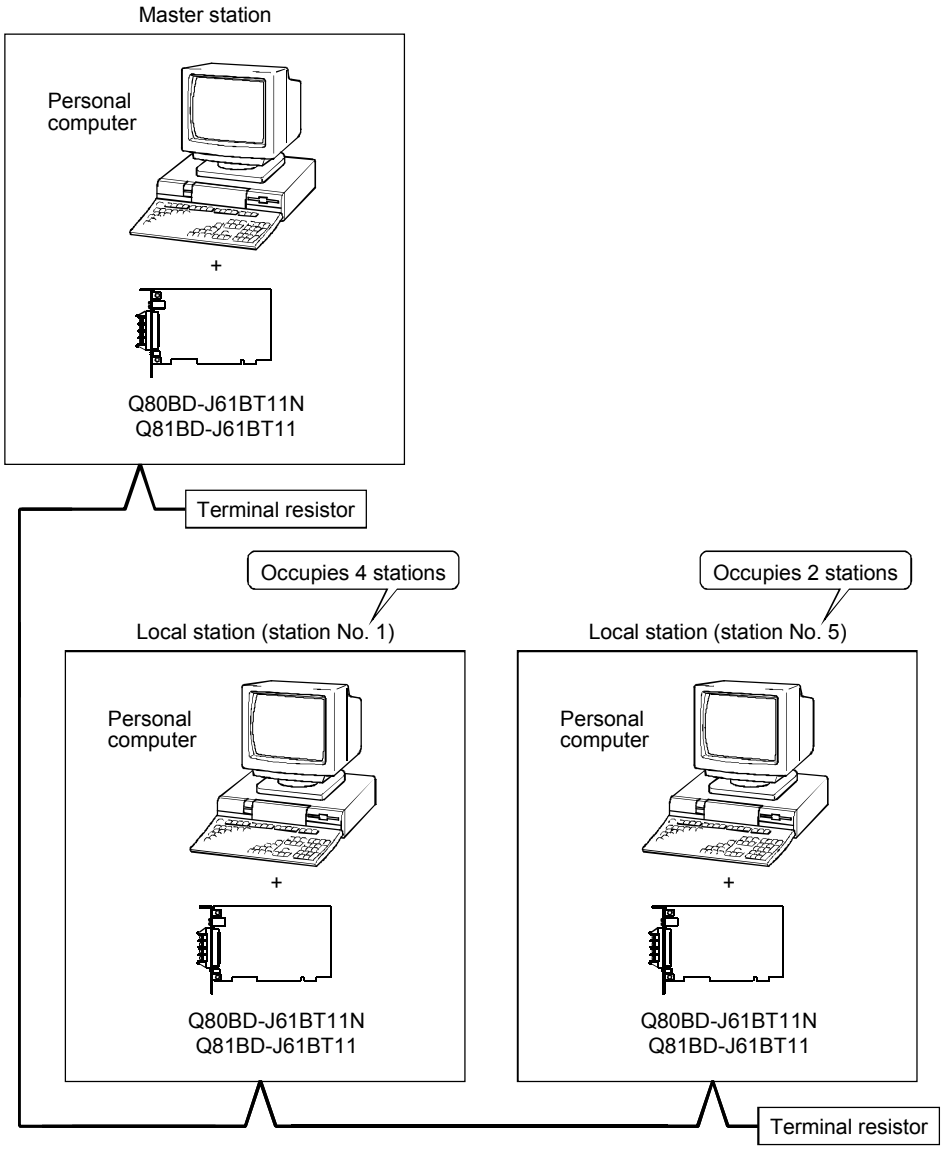


12.2 When Using the Remote Net Ver.2 Mode or Remote Net Additional Mode

The following describes communications in the remote net Ver.2 mode or the remote net additional mode.

12.2.1 Configuring the system

In this system, 2 local stations shall be connected.

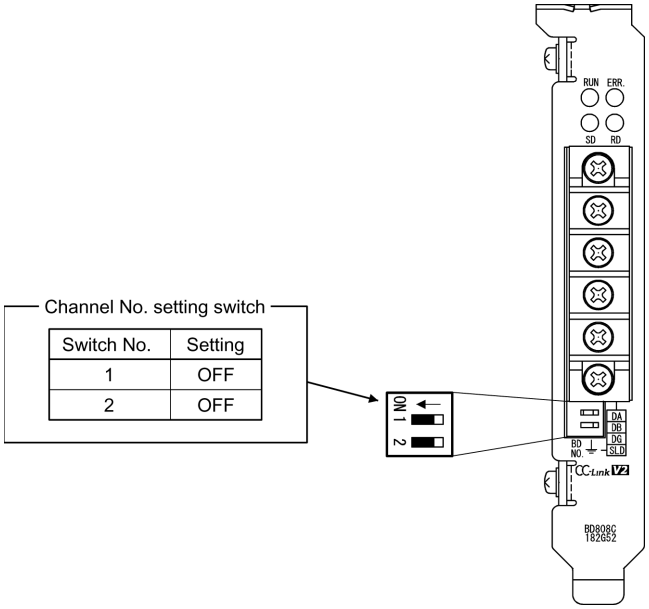


12.2.2 Setting the master station

The following shows the master station setting.

(1) Switch setting (channel No. setting)

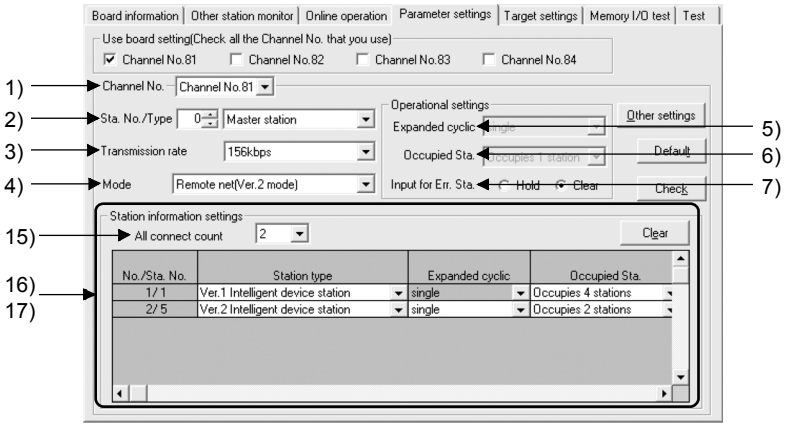
The channel No. for the CC-Link Ver.2 board is set to 81 as an example in this section.



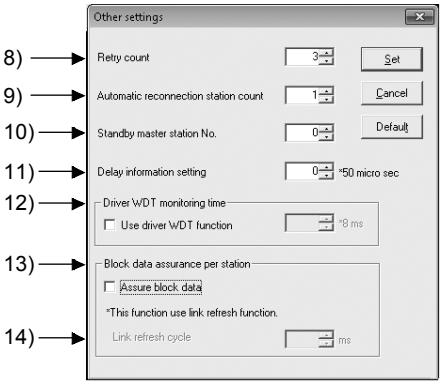
(2) Parameter settings

The following shows the master station's parameter settings by the CC-Link Ver.2 Utility.

<Parameter settings screen>



<Other settings screen>



(a) Parameter settings

The following shows the parameter setting values. The parameter setting check list and the station information setting check list in Appendix can be used for the setting.

Table 12.4 Parameter Setting Check List

Setting item		Setting range/Item
1) Channel No.		Channel No. 81 / Channel No.82 Channel No. 83 / Channel No.84
2) Sta. No./Type		No.0 Master station / Local station / Standby master station
3) Transmission rate		156kbps / 625kbps / 2.5Mbps / 5Mbps / 10Mbps
4) Mode		Remote net [Ver.1 mode] / Remote net [Ver.2 mode] Remote net [Additional mode] / Off line
Operational settings	5) Expanded cyclic	single / double / quadruple / octuple
	6) Occupied Sta.	Occupies 1 station / Occupies 2 stations Occupies 3 stations / Occupies 4 stations
	7) Input for Err. Sta.	Hold / Clear
Other settings	8) Retry count	3 Times
	9) Automatic reconnection station count	1 Modules
	10) Standby master station No.	No.0
	11) Delay information setting	0 × 50 micro sec
	12) Driver WDT Monitoring Time	No setting / × 8 ms
	13) Block data assurance per station	Disable / Enable
	14) Link refresh cycle	No setting / ms
Station information settings	15) All connect count	2 Modules

*1: To set the CC-Link system to the remote net Additional mode, select "Remote net Additional mode."

Table 12.5 Station Information Setting Check List

Sta. No.	Station type	Expanded cyclic	Occupied Sta.	Remote station points	Reserve/invalid station select	Intelligent buffer select (word)		
						Send	Receive	Automatic
16) 1	Ver.1 Intelligent device station *2	single	Occupies 4 stations	128 points	No setting	64	64	128
17) 5	Ver.2 Intelligent device station *2	double	Occupies 2 stations	96 points	No setting	64	64	128

*2: For the local station, select an intelligent device station.

12.2.3 Setting the local station

The following shows the local station setting.

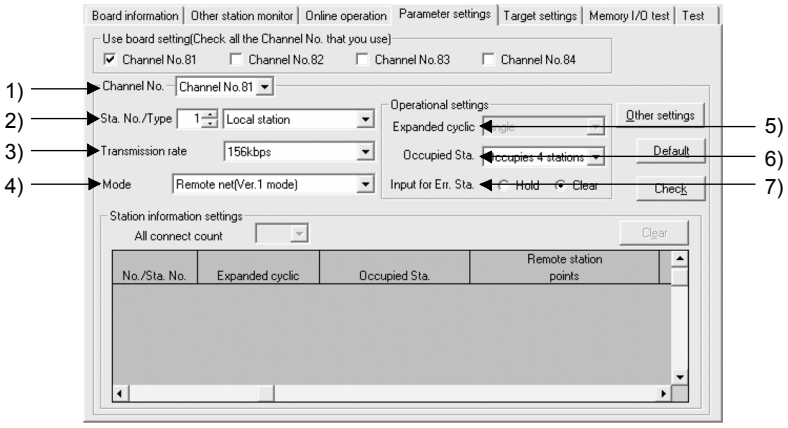
(1) Switch setting (channel No. setting)

The channel No. for the CC-Link Ver.2 board is set to 81 as an example in this section.
For the setting, refer to Section 12.2.2 (1).

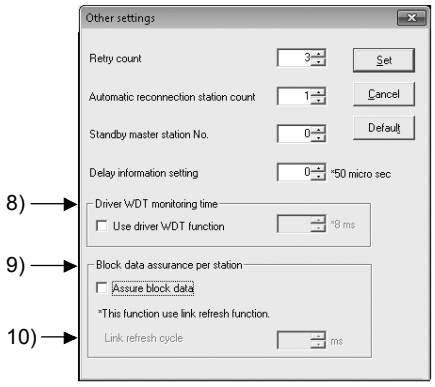
(2) Parameter settings

The following shows the local station's parameter settings by the CC-Link Ver.2 Utility.

<Parameter settings screen>



<Other settings screen>



(a) Parameter settings

The following shows the parameter setting values. The parameter setting check list and the station information setting check list in Appendix can be used for the setting.

Table 12.3 Parameter Setting Check List

Setting item		Setting range/Item
1) Channel No.		Channel No. 81 / Channel No.82 Channel No. 83 / Channel No.84
2) Sta. No./Type		No.1: Master station / Local station / Standby master station
3) Transmission rate		156kbps / 625kbps / 2.5Mbps / 5Mbps / 10Mbps
4) Mode		Remote net [Ver.1 mode] / Remote net [Ver.2 mode] Remote net [Additional mode] / Off line
Operational settings	5) Expanded cyclic	single / double / quadruple / octuple
	6) Occupied Sta.	Occupies 1 station / Occupies 2 stations Occupies 3 stations / Occupies 4 stations
	7) Input for Err. Sta.	Hold / Clear
Other settings	Retry count	3 Times
	Automatic reconnection station count	1 Modules
	Standby master station No.	No.0
	Delay information setting	0 × 50 micro sec
	8) Driver WDT Monitoring Time	No setting / × 8 ms
	9) Block data assurance perz station	Disable / Enable
	10) Link refresh cycle	No setting / ms
Station information settings	All connect count	Modules

*1: Set station No.5 to the Ver.2 Intelligent device station.
*2: Set Remote net [Ver.2 mode] to the Ver.2 intelligent device stations.
*3: Set "double" and "occupied 2 stations" to the Ver.2 intelligent device station.

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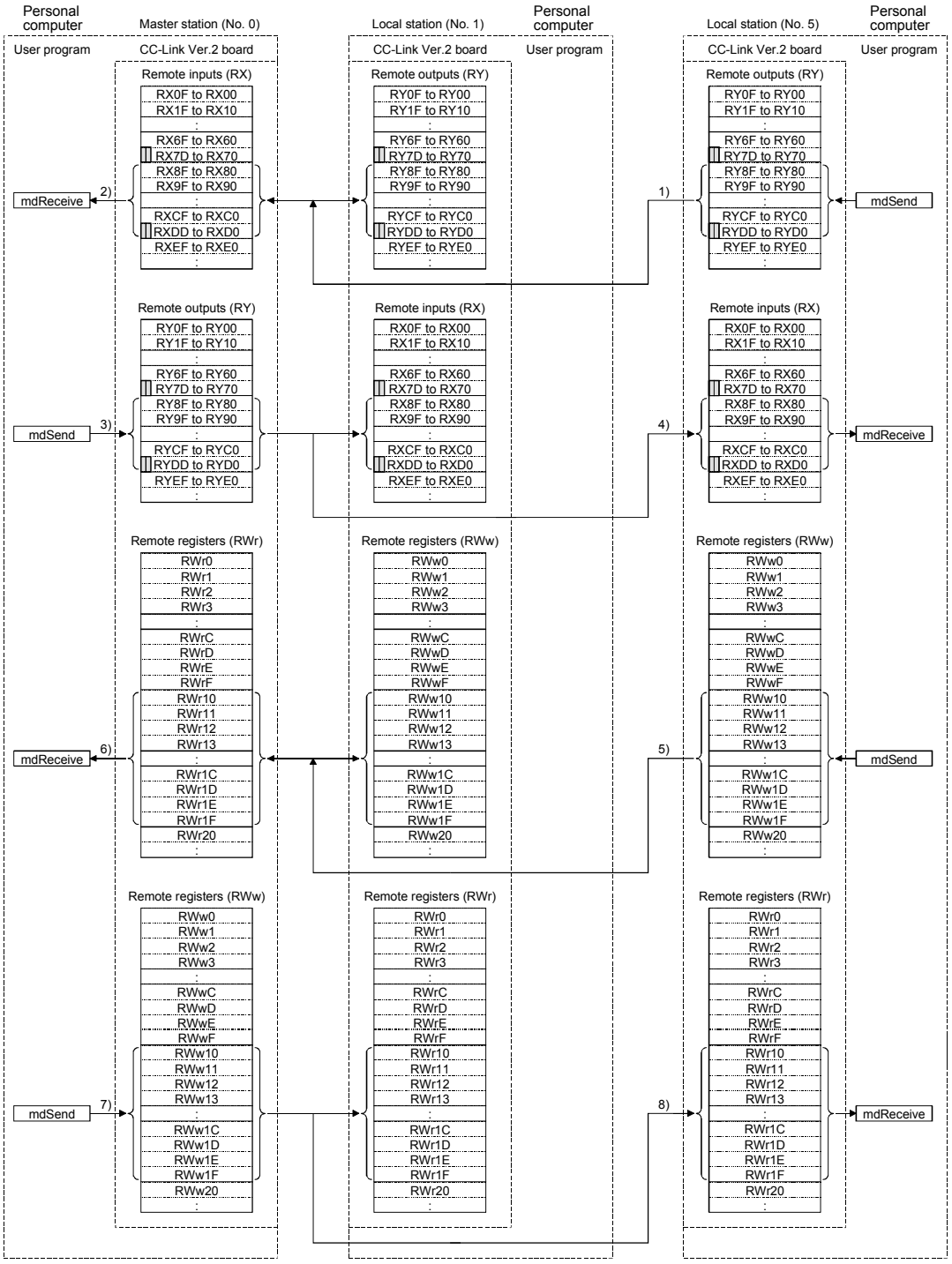
12.2.4 Creating a program

Create a program for reading the remote input (RX), writing the remote output (RY), reading the remote registers (RWr), and writing the remote registers (RWw) for local stations of station No.5*1.
The programming procedure for station No.5 is the same as in the remote net Ver.1 mode.
Refer to Section 12.1.4.

*1: For the local station of station No.5, device Nos. of the remote input (RX) and remote output (RY) and addresses of the remote registers (RWr, RWw) are changed.



12.2.5 Executing the data link

Turn ON the local stations and the master station in this order, and then start the data link.

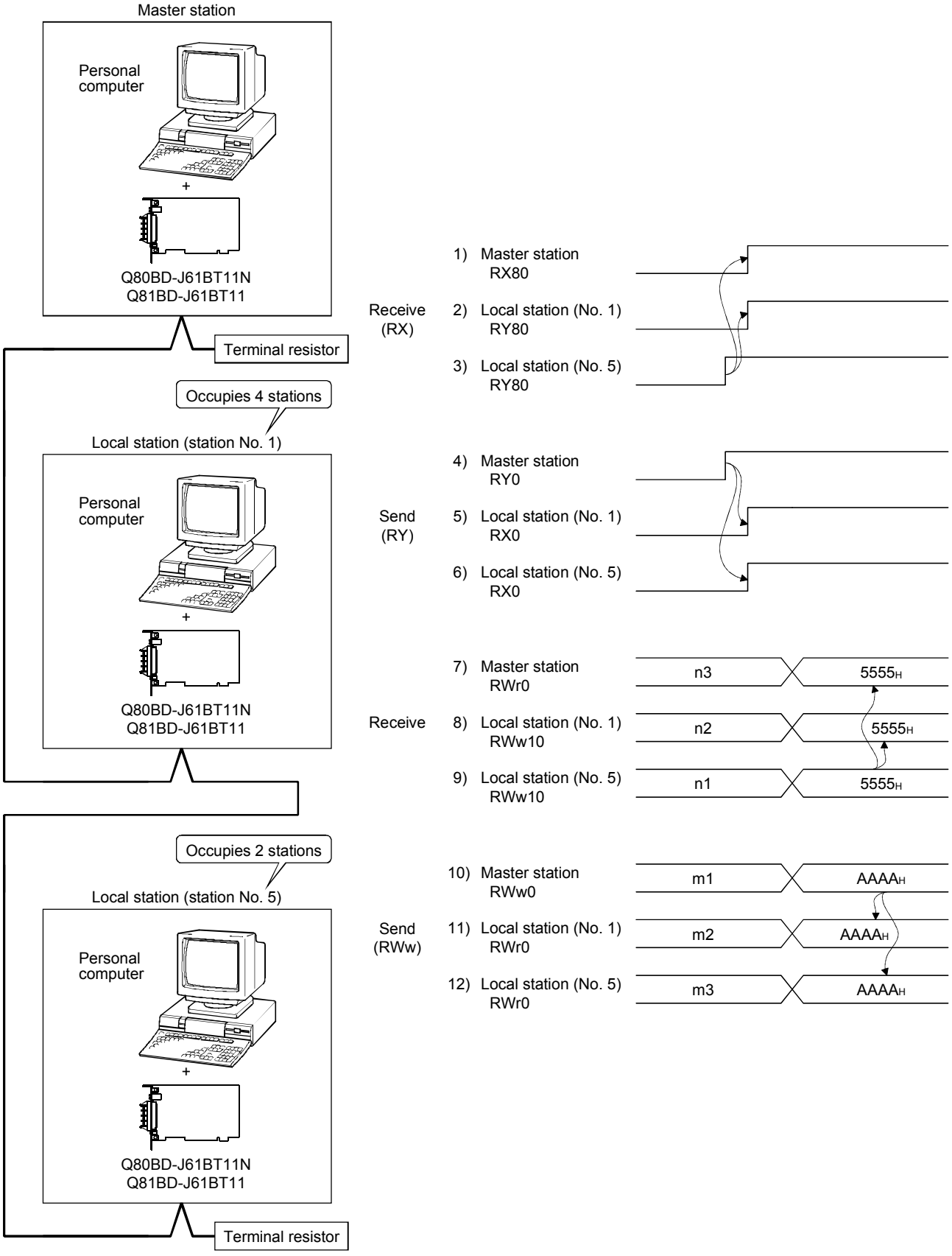
(1) Checking the data link status

Refer to Section 12.1.5 (1) (a) "Checking the master station and local stations" for how to check the operation status of the master station and local stations (Ver.1 intelligent device stations, Ver.2 intelligent device stations) under normal data link condition.

(2) Confirming the operation with a user program

With a user program, check whether the data link is performed correctly or not by transferring data between the master station and the local stations.
Use of the sample program allows the operation check in the system configuration shown on the next page. For details on the location where the sample program is stored, refer to MELSEC Data Link Library Reference Manual.
(Execute user program of the local station (Sta. No. 1 and 5) within 10 minutes after an user program of the master station has been loaded.)

When the remote output (RY80) 3) is turned ON, the remote input (RX80) 1) and the remote output (RY80) 2) turns ON.
When the remote output (RY0) 4) is turned ON, the remote input (RX0) 5) and 6) turn ON.
When a value is set to the remote register (RWw10) 9), the value is written to the remote register (RWr10) 7) and the remote register (RWw10) 8).
When a value is set to the remote register (RWw0) 10), the value is written to the remote registers (RWr0) 11) and 12).


Master station
Personal computer
+
Q80BD-J61BT11N
Q81BD-J61BT11
Terminal resistor
Occupies 4 stations
Local station (station No. 1)
Personal computer
+
Q80BD-J61BT11N
Q81BD-J61BT11
Occupies 2 stations
Local station (station No. 5)
Personal computer
+
Q80BD-J61BT11N
Q81BD-J61BT11
Terminal resistor
Receive (RX)
1) Master station RX80
2) Local station (No. 1) RY80
3) Local station (No. 5) RY80
Send (RY)
4) Master station RY0
5) Local station (No. 1) RX0
6) Local station (No. 5) RX0
Receive
7) Master station RWr0
8) Local station (No. 1) RWw10
9) Local station (No. 5) RWw10
n3
5555H
n2
5555H
n1
5555H
Send (RWw)
10) Master station RWw0
11) Local station (No. 1) RWr0
12) Local station (No. 5) RWr0
m1
AAAAH
m2
AAAAH
m3
AAAAH

12 - 15

MEMO

12 - 16

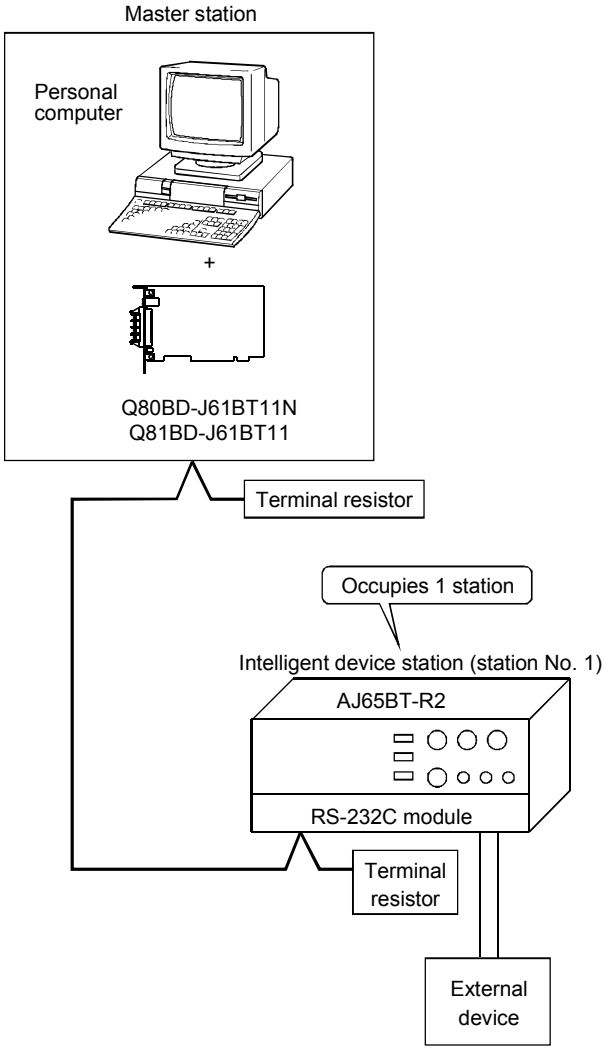
13 COMMUNICATION BETWEEN THE MASTER STATION AND INTELLIGENT DEVICE STATION (AJ65BT-R2)

This section gives f a system configuration example to explain the CC-Link Ver.2 board and intelligent device station setting, parameter setting, programming and operation check.

For details on the intelligent device stations, refer to the RS-232C Interface Module type AJ65BT-R2 User's Manual.

13.1 Configuring a System

In this example, a system consisting of a master station and one intelligent device station (AJ65BT-R2) as shown below is used.



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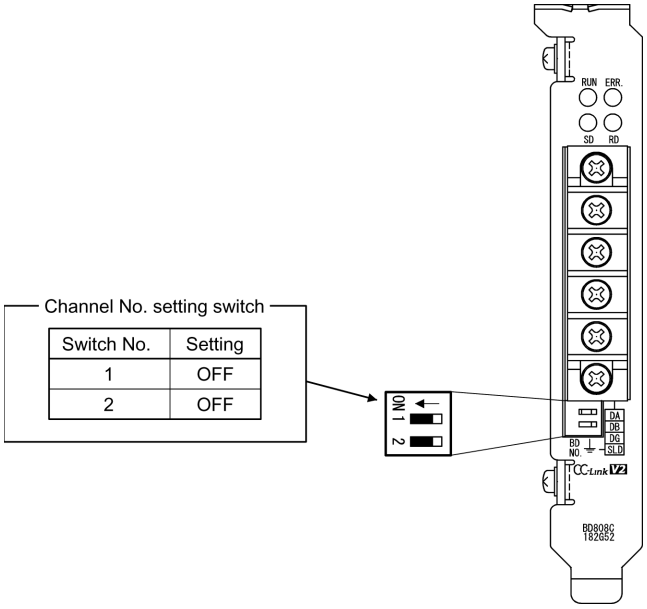
13.2 Setting the Master Station

The following shows the master station setting.

13.2.1 Switch setting (channel No. setting)

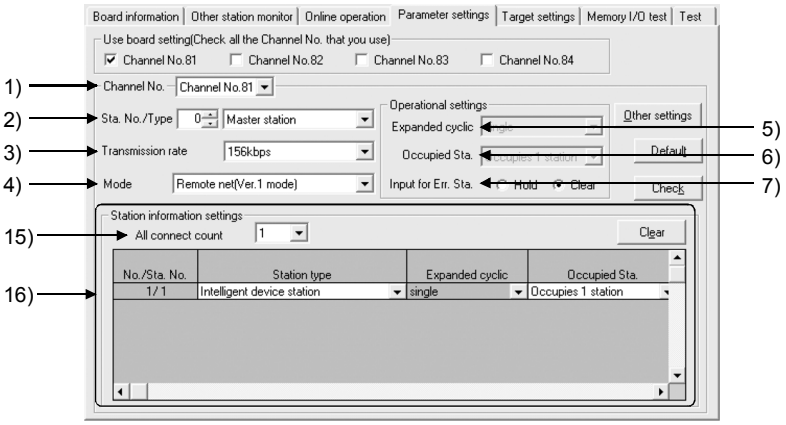
The channel No. for the CC-Link Ver.2 board is set to 81 as an example in this section.



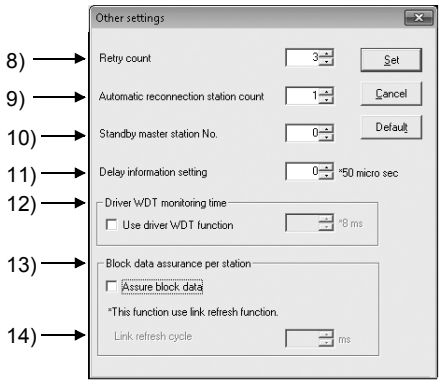
13.2.2 Parameter settings

The following shows the master station's parameter settings by the CC-Link Ver.2 Utility.

<Parameter settings screen>



<Other settings screen>



(1) Parameter settings

The following shows the parameter setting values. The parameter setting check list and the station information setting check list in Appendix can be used for the setting.

Table 13.1 Parameter Setting Check List

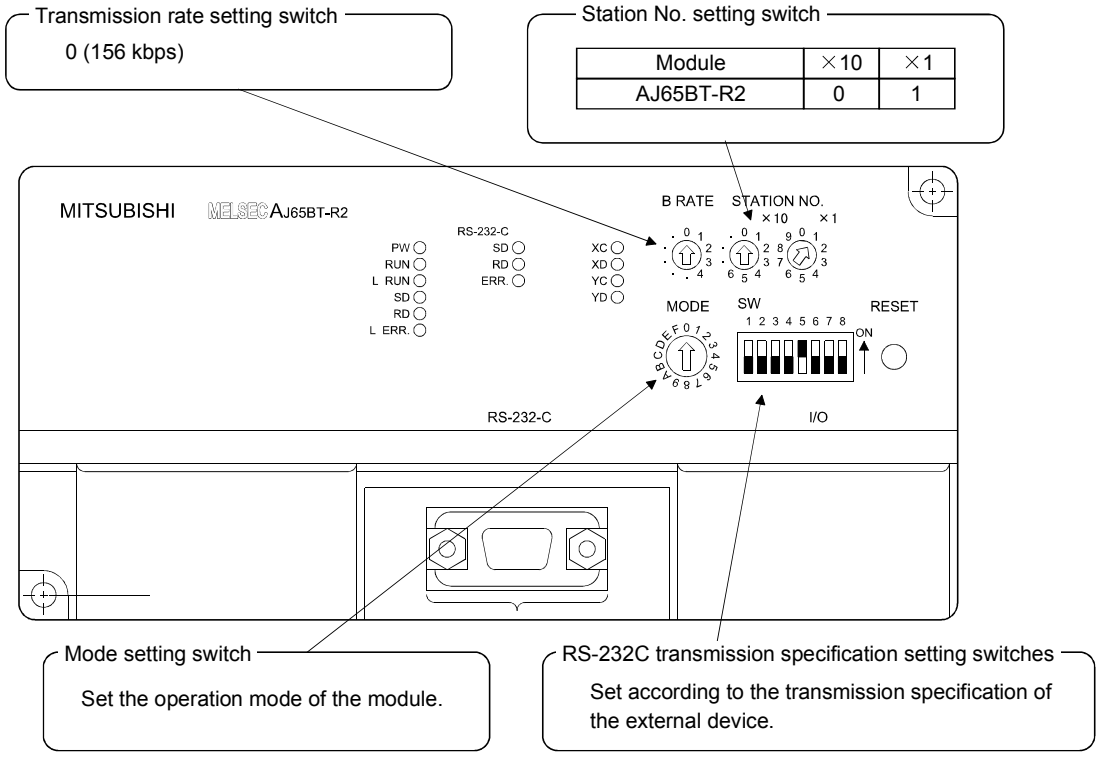
Setting item		Setting range/Item
1) Channel No.		Channel No. 81 / Channel No.82 Channel No. 83 / Channel No.84
2) Sta. No./Type		No.0 Master station / Local station / Standby master station
3) Transmission rate		156kbps / 625kbps / 2.5Mbps / 5Mbps / 10Mbps
4) Mode		Remote net [Ver.1 mode] / Remote net [Ver.2 mode] Remote net [Additional mode] / Off line
Operational settings	5) Expanded cyclic	single / double / quadruple / octuple
	6) Occupied Sta.	Occupies 1 station / Occupies 2 stations Occupies 3 stations / Occupies 4 stations
	7) Input for Err. Sta.	Hold / Clear
Other settings	8) Retry count	3 Times
	9) Automatic reconnection station count	1 Modules
	10) Standby master station No.	No.0
	11) Delay information setting	0 × 50 micro sec
	12) Driver WDT Monitoring Time	No setting / × 8 ms
	13) Block data assurance per station	Disable / Enable
	14) Link refresh cycle	No setting / ms
Station information settings	15) All connect count	1 Modules

Table 13.2 Station Information Setting Check List

Sta. No.	Station type	Expanded cyclic	Occupied Sta.	Remote station points	Reserve/invalid station select	Intelligent buffer select (word)		
						Send	Receive	Automatic
16) 1	Intelligent device station	single	Occupies 1 station	32 points	No setting	64	64	128
2								
3								

13.3 Setting up the intelligent device station

The settings of the intelligent device station switches are shown below:



13.4 Creating a Program

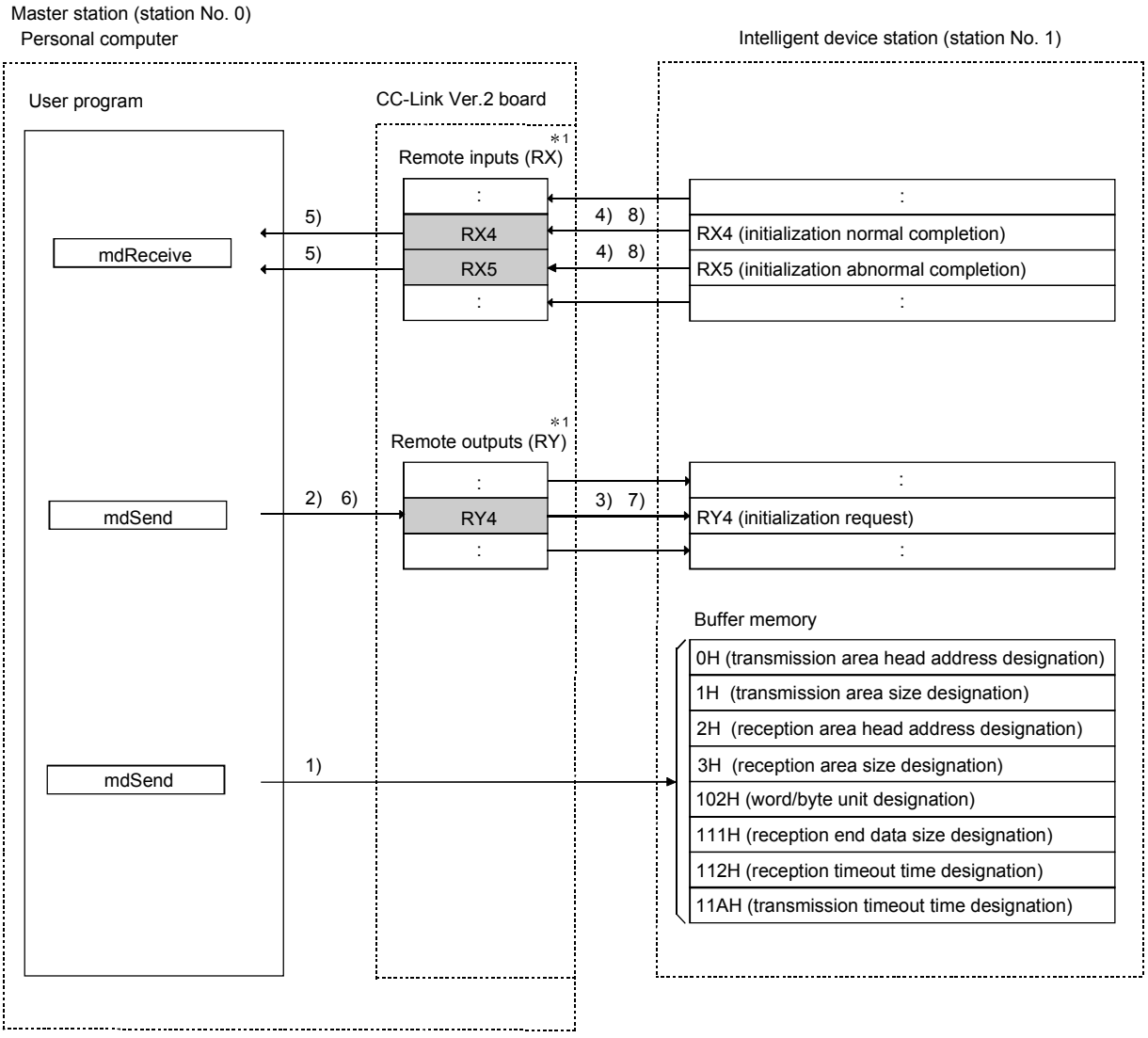
Create a program for making the following setting and data transfer to the AJ65BT-R2.

- Initialization of the AJ65BT-R2 ..... Refer to Section 13.4.1.
- Data transmission ..... Refer to Section 13.4.2.
- Data reception..... Refer to Section 13.4.3.

13.4.1 Initialization of the AJ65BT-R2

The following describes initialization of the AJ65BT-R2 ＊1, and shows the relation between the user program on the PC and intelligent device station's I/O operations. (The shaded areas indicate the devices that are actually used.)

＊1: In the AJ65BT-R2 initialization, default values are used for settings other than those indicated in the buffer memory section of the illustration below.

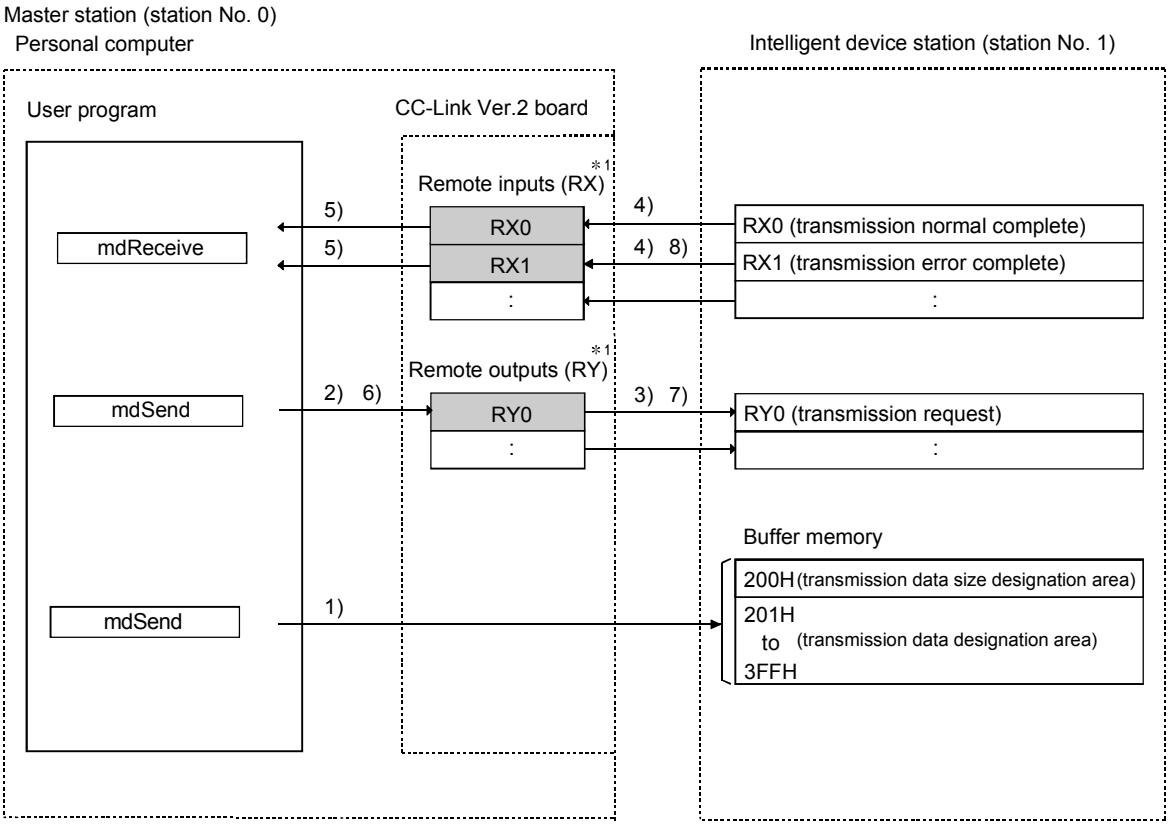


＊1: When the remote net Ver.2 mode is selected, refer to the figure in Section 4.4.7 (1). When the remote net additional mode is selected, refer to the figure in Section 4.4.7 (2).

User Program		CC-Link Ver.2 Board
1) Writes the initial setting values for transmission/ reception to the buffer memory on the AJ65BT-R2. Arguments to be set: Word/byte unit designation=0 Transmission area head address designation=200H Transmission area size designation=200H Reception area head address designation=400H Reception area size designation=200H Transmission timeout time designation=0		
2) Turns ON the initialization request signal (RY4).	→	3) Turns ON the initialization request signal (RY4) of the AJ65BT-R2.
		4) If the initialization of the AJ65BT-R2 is normal, the initialization normal complete signal (RX4) turns ON. If not, the initialization error complete signal (RX5) turns ON.
5) Reads out the initialization normal complete signal (RX4).	←	
6) With the initialization normal complete signal (RX4) ON, the initialization request signal (RY4) is turned OFF.	→	7) Turns OFF the initialization request signal (RY4).
		8) The AJ65BT-R2 turns OFF the initialization normal complete signal (RX4) and the initialization error complete signal (RX5).

13.4.2 Data transmission

The following illustrates the relation between the intelligent device station's I/O operations and the user program on the PC and their data transmission. (The shaded areas indicate the devices that are actually used.)

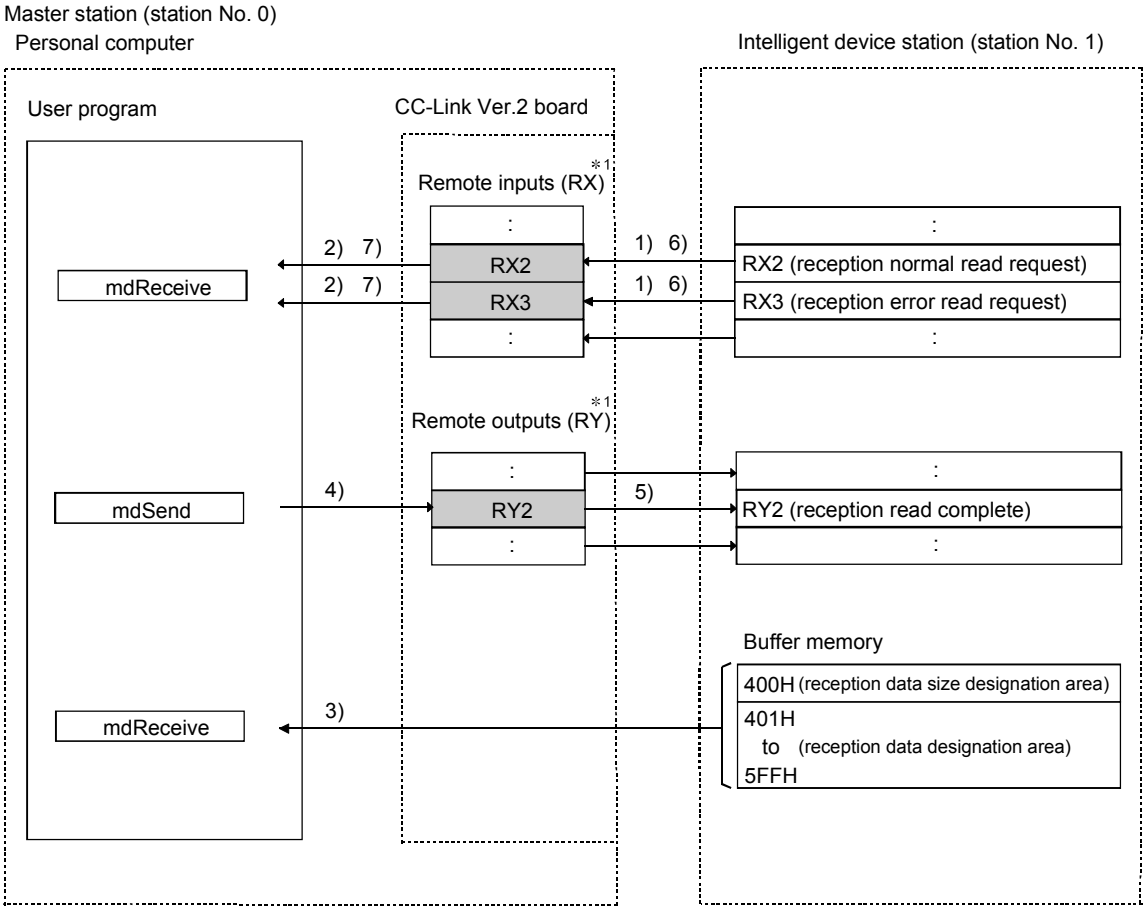


*1: When the remote net Ver.2 mode is selected, refer to the figure in Section 4.4.7(1).
When the remote net additional mode is selected, refer to the figure in Section 4.4.7(2).

User Program	CC-Link Ver.2 Board
1) Writes the send data to the transmission area of the AJ65BT-R2 buffer memory.	
2) Turn ON the transmission request signal (RY0). →	3) Turn ON the transmission request signal (RY0) of the AJ65BT-R2.
	4) The AJ65BT-R2 sends data to external equipment, and if the transmission is normal, it turns ON the transmission normal complete signal (RX0). If an error is identified in the transmission, the AJ65BT-R2 turns ON the transmission error complete signal (RX1).
5) Reads out the transmission normal complete signal (RX0) and the transmission error complete signal (RX1). ←	
6) Turns OFF the transmission request signal (RY0). →	7) Turns OFF the transmission request signal (RY0) of the AJ65BT-R2.
	8) The AJ65BT-R2 turns OFF the transmission normal complete signal (RX0) or transmission error complete signal (RX1).

13.4.3 Data reception

The following illustrates the relation between the intelligent device station's I/O operations and the user program on the PC in data reception.
(The shaded areas indicate the devices that are actually used.)



*1: When the remote net Ver.2 mode is selected, refer to the figure in Section 4.4.7(1).
When the remote net additional mode is selected, refer to the figure in Section 4.4.7(2).

User Program		CC-Link Ver.2 Board
2) Reads out the reception normal read request signal (RX2) and the reception error read request signal (RX3).	←	1) When the AJ65BT-R2 receives data from external equipment, the reception normal read request signal (RX2) or reception error read request signal (RX3) is turned ON.
3) With the reception normal read request signal (RX2) ON, reads out the received data.		
4) Turns ON the reception read complete signal (RY2).	→	5) Turns ON the reception read complete signal (RY2) of the AJ65BT-R2.
		6) The AJ65BT-R2 turns OFF the reception normal read complete signal (RX2) or reception error read complete signal (RX3).
7) Reads out the reception normal read request signal (RX2).	←	
8) Turns OFF the reception read complete signal (RY2).		

13.5 Executing the Data Link

To start the data link , first power on the intelligent device station, and then the master station.

13.5.1 Checking the data link status

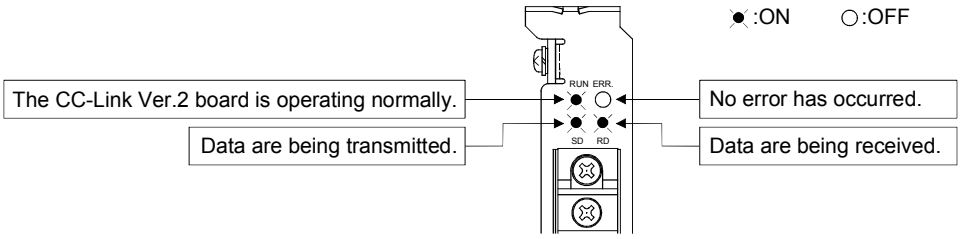
The following describes how to check the operation status of the master station and intelligent device stations under normal data link condition.

(1) Checking the master station

Check the operating status of the master station.

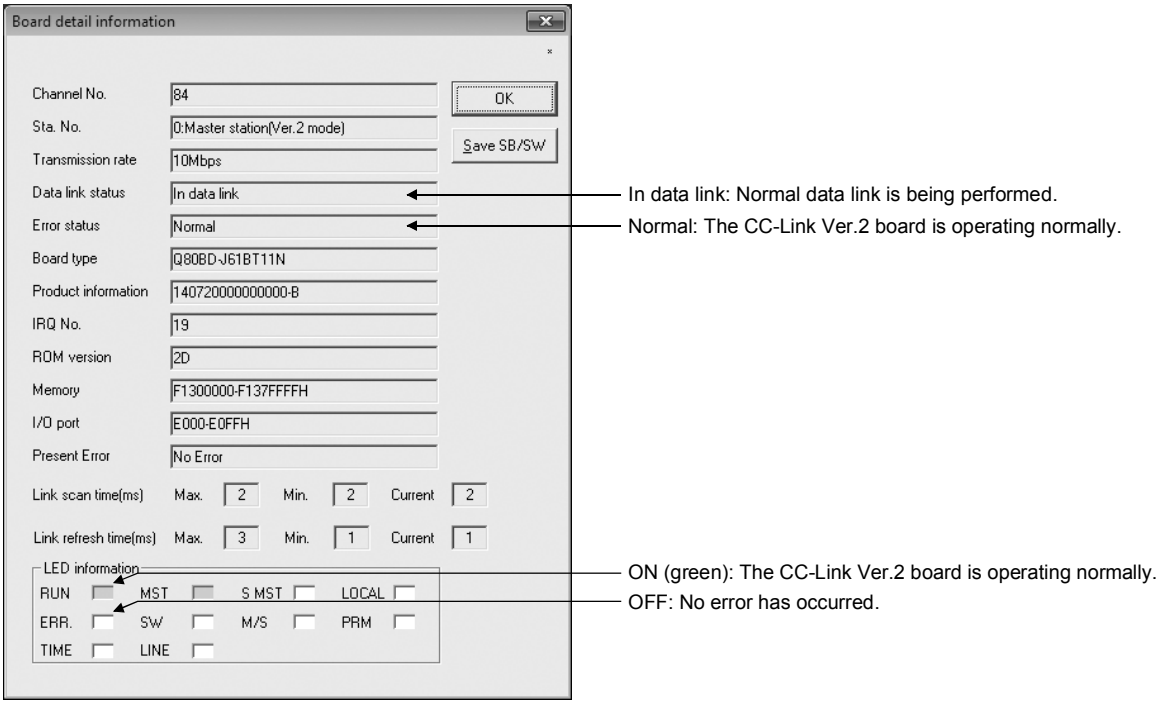
(a) Checking by the LED indication on the CC-Link Ver.2 board

Make sure that the LED status is as follows.



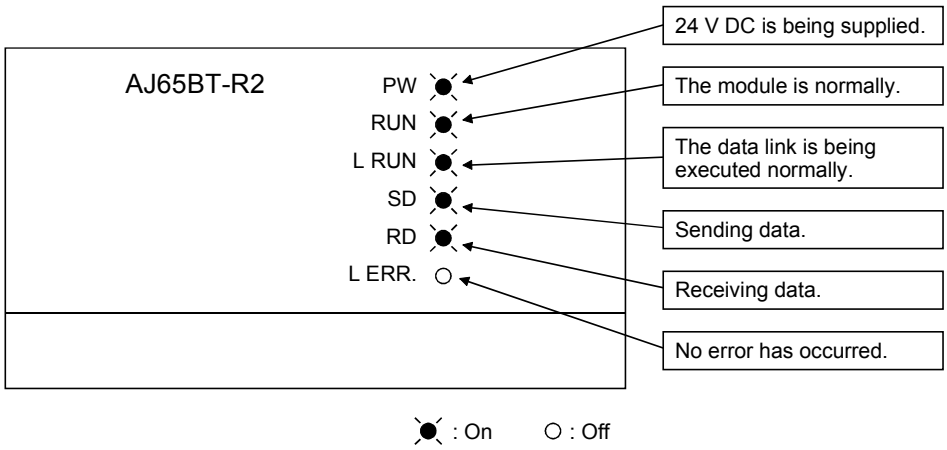
(b) Checking by the CC-Link Ver.2 Utility

Check that the Board detail information on the CC-Link Ver.2 Utility is displayed as shown below.


Board detail information
Channel No. 84
Sta. No. 0:Master station(Ver.2 mode)
Transmission rate 10Mbps
Data link status In data link
Error status Normal
Board type Q80BD-J61BT11N
Product information 140720000000000-B
IRQ No. 19
ROM version 2D
Memory F1300000-F137FFFFH
I/O port E000-E0FFH
Present Error No Error
Link scan time(ms) Max. 2 Min. 2 Current 2
Link refresh time(ms) Max. 3 Min. 1 Current 1
LED information
RUN MST S MST LOCAL
ERR. SW M/S PRM
TIME LINE
OK
Save SB/SW
In data link: Normal data link is being performed.
Normal: The CC-Link Ver.2 board is operating normally.
ON (green): The CC-Link Ver.2 board is operating normally.
OFF: No error has occurred.

(2) LED displays of the intelligent device station

Be sure that the LED displays show the following status:



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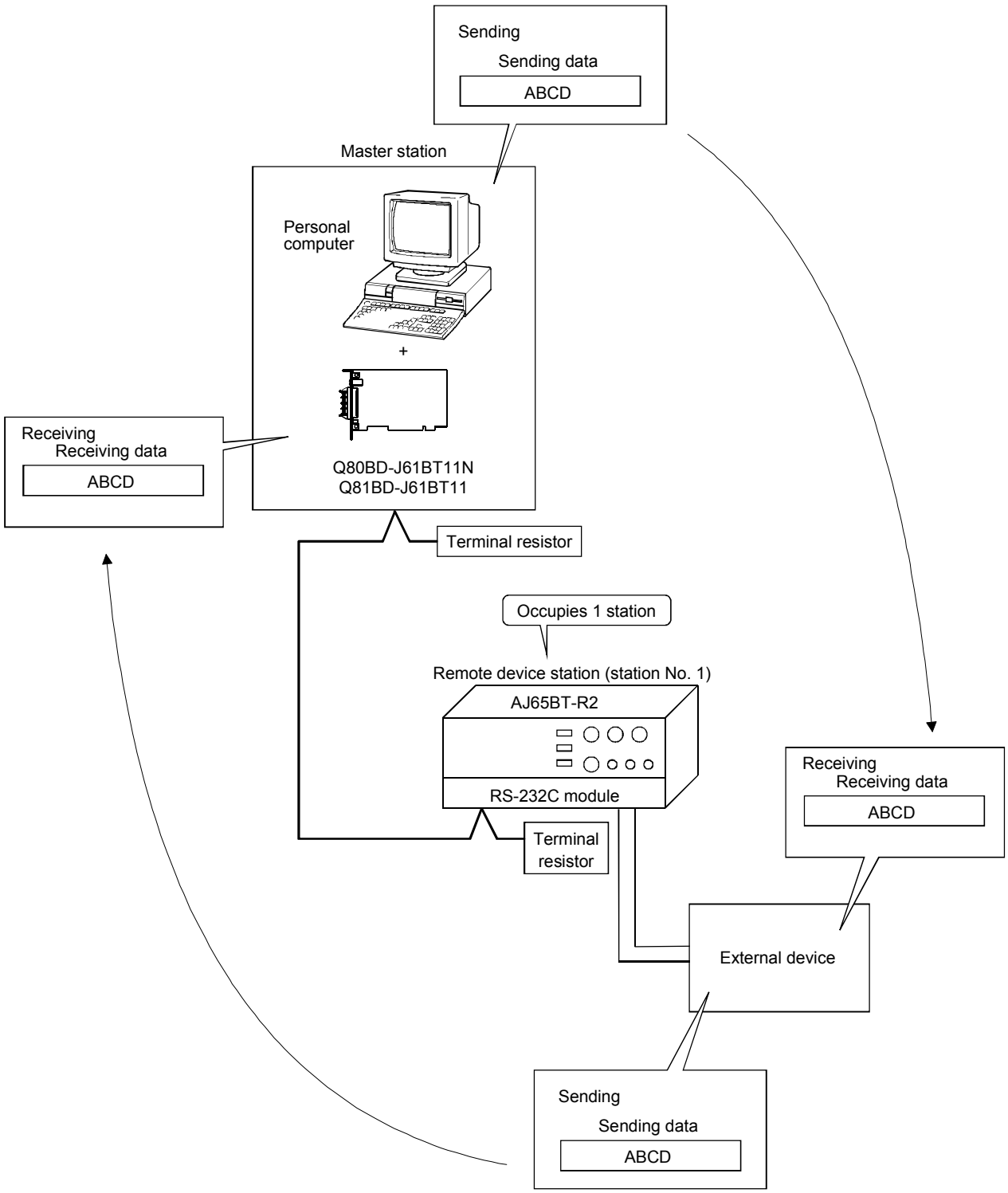
13.5.2 Confirming the operation with a user program

Using a user program, confirm that the data link is being executed normally.
Use of the sample program allows the operation check in the following system configuration.
For details on the location where the sample program is stored, refer to MELSEC Data Link Library Reference Manual.
With the sample program, initialization, transmission and reception are available.



MEMO

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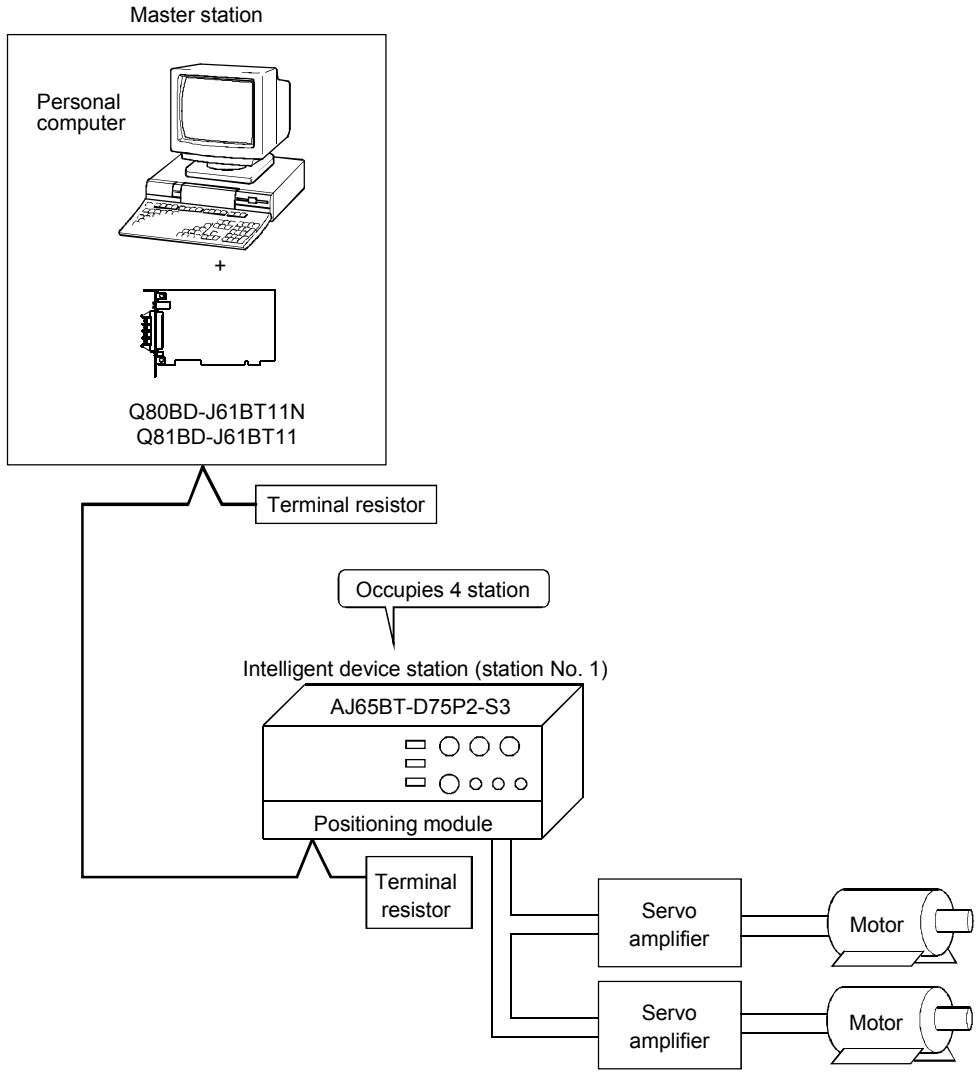
14 COMMUNICATION BETWEEN THE MASTER STATION AND INTELLIGENT DEVICE STATION (AJ65BT-D75P2-S3)

This section gives a system configuration example to explain the CC-Link Ver.2 board and intelligent device station setting, parameter setting, programming and operation check.
For details on intelligent device stations, refer to the AJ65BT-D75P2-S3 Positioning Module User's Manual.

14.1 Configuring a System

In this example, a system consisting of a master station and one intelligent device station (AJ65BT-D75P2-S3) as shown below is used.



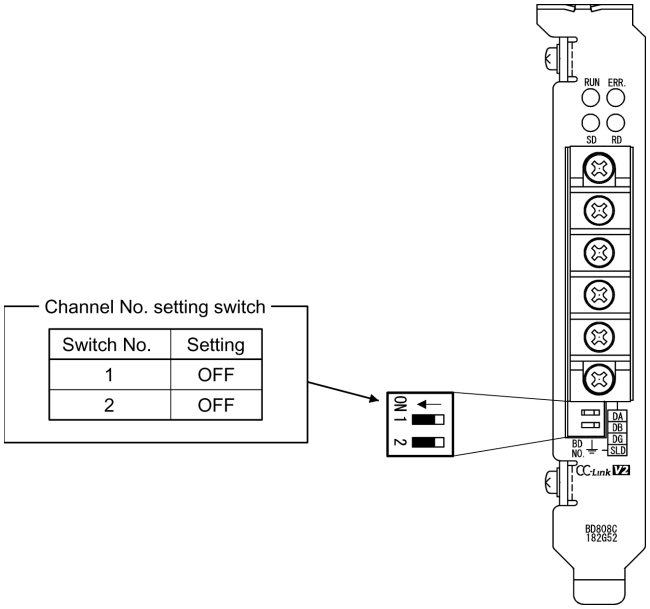
14 - 1

14.2 Setting the Master Station

The following shows the master station setting.

14.2.1 Switch setting (channel No. setting)

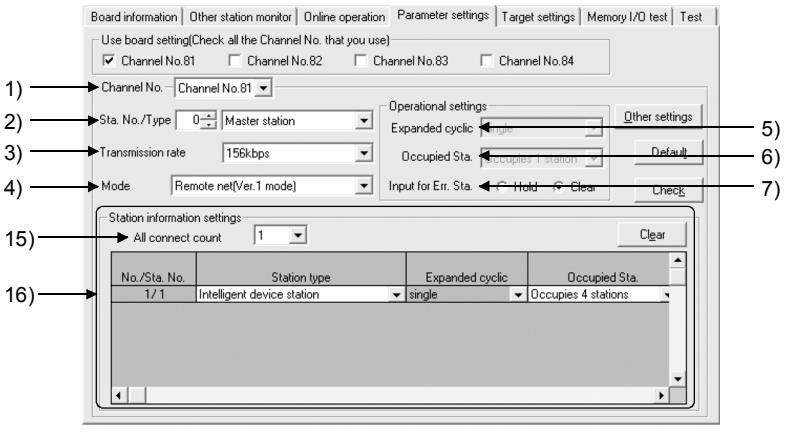
The channel No. for the CC-Link Ver.2 board is set to 81 as an example in this section.



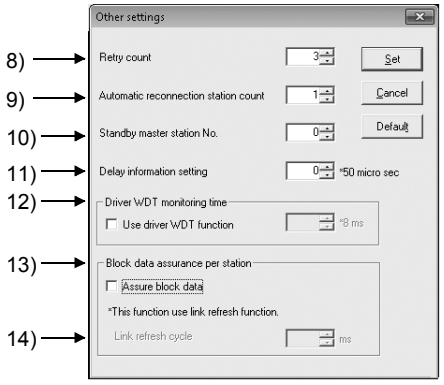
14.2.2 Parameter settings

The following shows the master station's parameter settings by the CC-Link Ver.2 Utility.

<Parameter settings screen>



<Other settings screen>



(1) Parameter settings

The following shows the parameter setting values. The parameter setting check list and the station information setting check list in Appendix can be used for the setting.

Table 14.1 Parameter Setting Check List

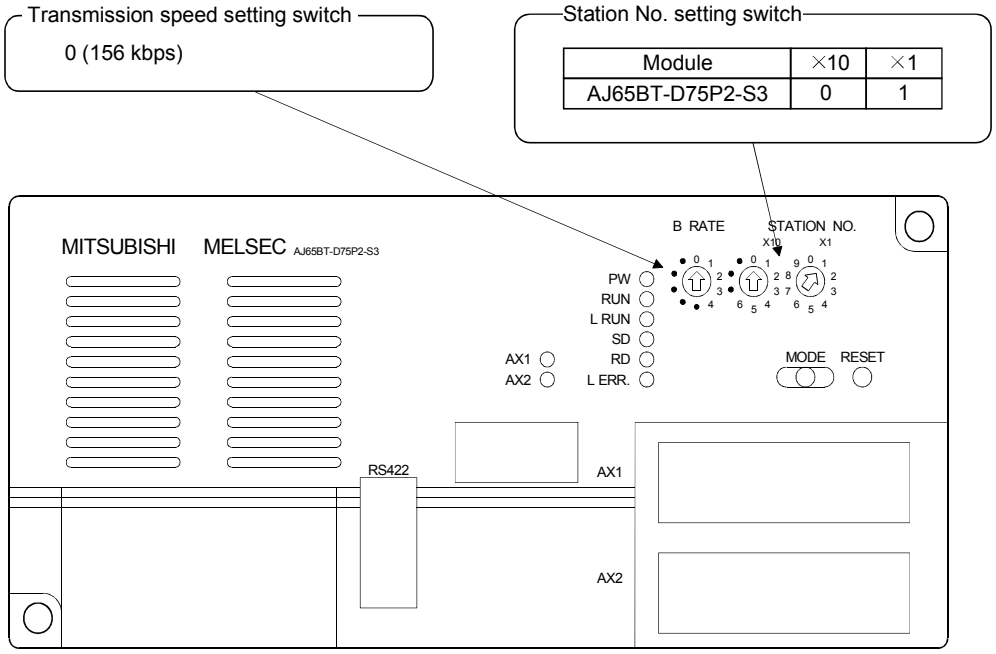
Setting item		Setting range/Item
1) Channel No.		Channel No. 81 / Channel No.82 Channel No. 83 / Channel No.84
2) Sta. No./Type		No.0 Master station / Local station / Standby master station
3) Transmission rate		156kbps / 625kbps / 2.5Mbps / 5Mbps / 10Mbps
4) Mode		Remote net [Ver.1 mode] / Remote net [Ver.2 mode] Remote net [Additional mode] / Off line
Operational settings	5) Expanded cyclic	single / double / quadruple / octuple
	6) Occupied Sta.	Occupies 1 station / Occupies 2 stations Occupies 3 stations / Occupies 4 stations
	7) Input for Err. Sta.	Hold / Clear
Other settings	8) Retry count	3 Times
	9) Automatic reconnection station count	1 Modules
	10) Standby master station No.	No.0
	11) Delay information setting	0 × 50 micro sec
	12) Driver WDT Monitoring Time	No setting / × 8 ms
	13) Block data assurance per station	Disable / Enable
	14) Link refresh cycle	No setting / ms
Station information settings	15) All connect count	1 Modules

Table 14.2 Station Information Setting Check List

Sta. No.	Station type	Expanded cyclic	Occupied Sta.	Remote station points	Reserve/invalid station select	Intelligent buffer select (word)		
						Send	Receive	Automatic
16) 1	Intelligent device station	single	Occupies 4 stations	128 points	No setting	64	64	128
2								
3								

14.3 Setting up the intelligent device station (AJ65BT-D75P2-S3)

The settings of the intelligent device station (AJ65BT-D75P2-S3) switches are shown below:



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14.4 Creating a Program

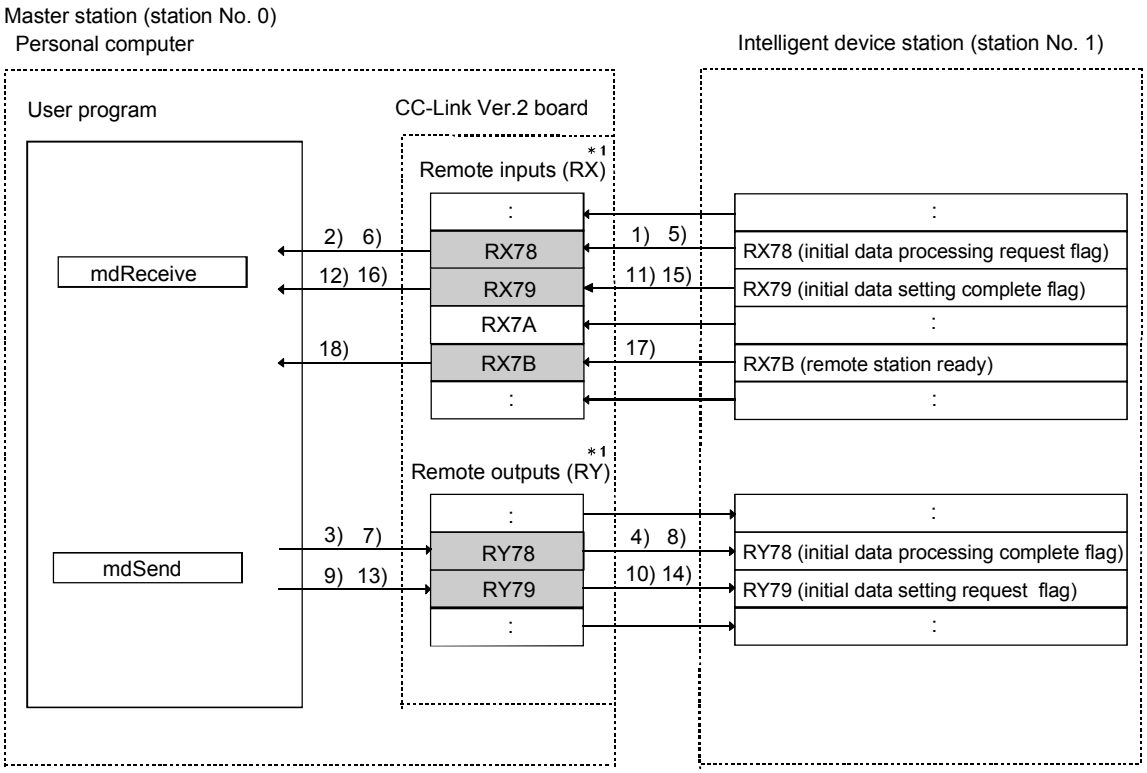
Create the program for the following setting and controls of the AJ65BT-D75P2-S3.

- Initial setting ..... Refer to Section 14.4.1.
- Zero point return control ..... Refer to Section 14.4.2.
- Positioning control..... Refer to Section 14.4.3.
- JOG operation control..... Refer to Section 14.4.4.

POINT
Set parameters and perform positioning settings in advance with the AD75 software package. If a user program is used to perform reading and writing from/to the buffer memory, the communication time delay may occur and the user program becomes complicated.

14.4.1 Initial setting

The following shows the relation between the user program on the PC and intelligent device station's I/O operations, and initial setting of the AJ65BT-D75P2-S3.
(The shaded areas indicate the devices that are actually used.)

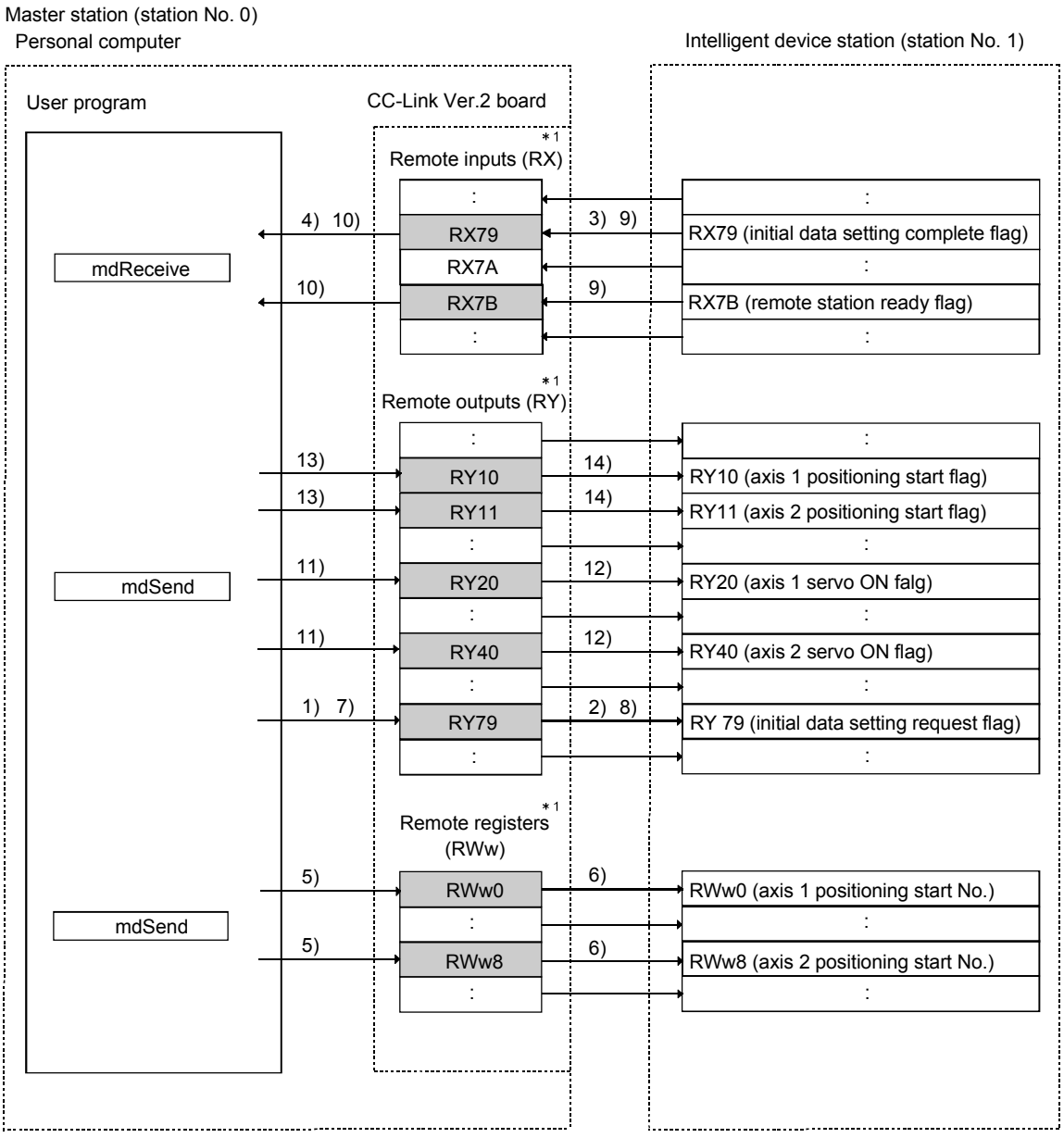


*1: When the remote net Ver.2 mode is selected, refer to the figure in Section 4.4.7 (1).
When the remote net additional mode is selected, refer to the figure in Section 4.4.7 (2).

User Program		CC-Link Ver.2 Board
2) Reads out the initial data processing request flag (RX78).	←	1) When the AJ65BT-D75P2-S3 is turned ON or reset by the reset switch, the initial data processing request flag (RX78) is turned ON.
3) With the initial data processing request flag (RX78) ON, turns ON the initial data processing complete flag (RY78).	→	4) Turns ON the initial data processing complete flag (RY78) of the AJ65BT-D75P2-S3.
6) Reads out the initial data processing request flag (RX78).	←	5) The AJ65BT-D75P2-S3 turns OFF the initial data processing request flag (RX78).
7) With the initial data processing request flag (RX78) OFF, turns OFF the initial data processing complete flag (RY78).	→	8) Turns OFF the initial data processing complete flag (RY78) of the AJ65BT-D75P2-S3.
9) Turn ON the initial data setting request flag (RY79).	→	10) Turn ON the initial data setting request flag (RY79) of the AJ65BT-D75P2-S3.
12) Reads out the initial data setting complete flag (RX79).	←	11) The AJ65BT-D75P2-S3 turns ON the initial data setting complete flag (RX79).
13) With the initial data setting complete flag (RX79) ON, turns OFF the initial data setting request flag (RY79).	→	14) Turns OFF the initial data setting request flag (RY79) of the AJ65BT-D75P2-S3.
16) Reads out the initial data setting complete flag (RX79).	←	15) The AJ65BT-D75P2-S3 turns OFF the initial data setting complete flag (RX79).
18) Reads out the remote station READY flag (RX7B).	←	17) The AJ65BT-D75P2-S3 turns ON the remote station READY flag (RX7B).

14.4.2 Zero point return control

The following shows the relation between the user program on the PC and intelligent device station's I/O operations, and the zero point return control.
(The shaded areas indicate the devices that are actually used.)



*1: When the remote net Ver.2 mode is selected, refer to the figure in Section 4.4.7 (1).
When the remote net additional mode is selected, refer to the figure in Section 4.4.7 (2).

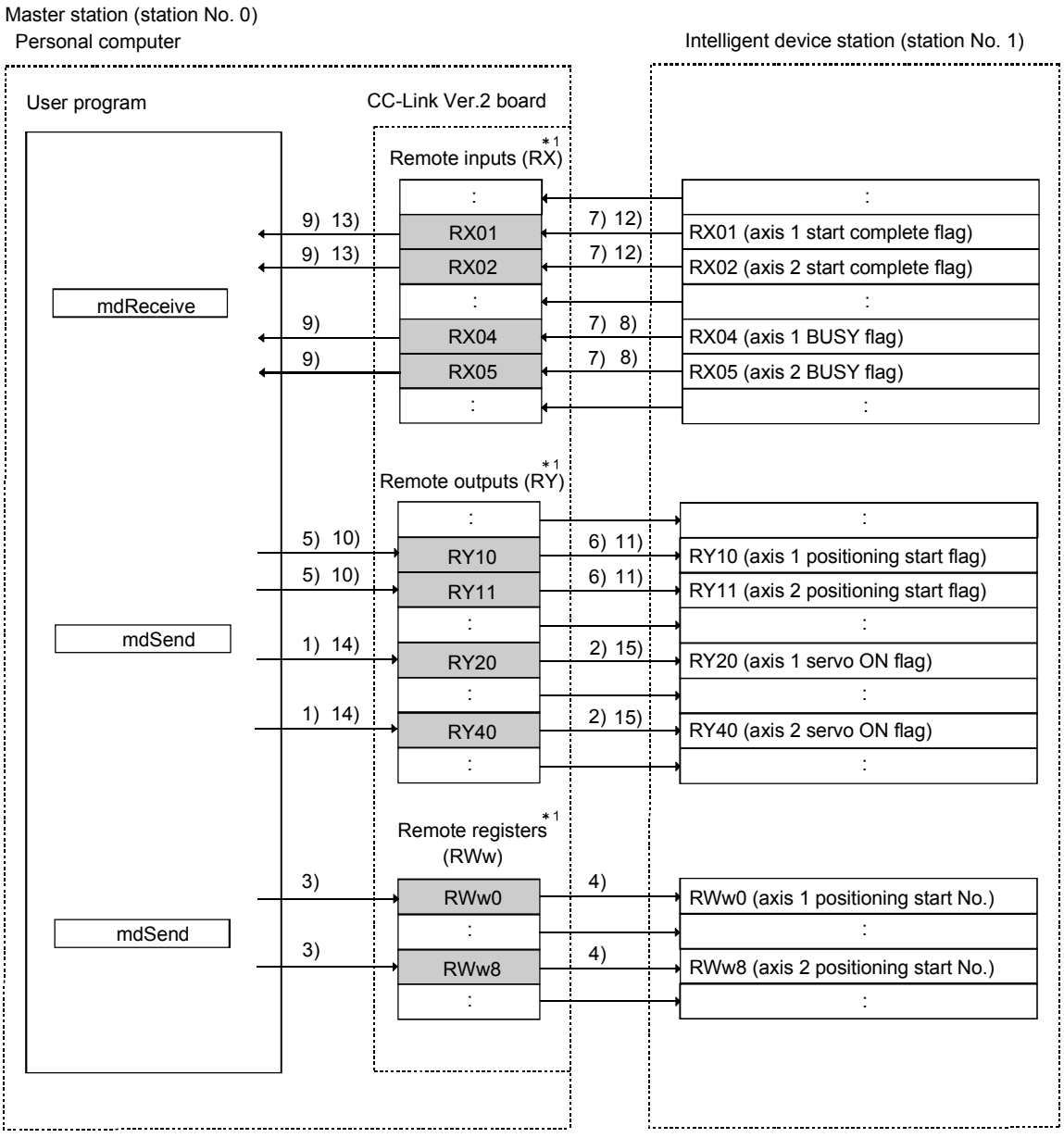
User Program		CC-Link Ver.2 Board
1) Turns ON the initial data setting request flag (RY79).	←	2) Turns ON the initial data setting request flag (RY79) on the AJ65BT-D75P2-S3.
4) Reads out the initial data setting complete flag (RX79).	←	3) The AJ65BT-D75P2-S3 turns ON the initial data setting complete flag (RX79).
5) With the initial data setting complete flag (RX79) ON, writes start No. to the Axis 1 positioning start No. setting area (RWw0) and Axis 2 positioning start No. setting area (RWw8).	→	6) Writes the start No. to the Axis 1 positioning start No. setting area (RWw0) and Axis 2 positioning start No. setting area (RWw8) of the AJ65BT-D75P2-S3.
7) Turns OFF the initial data setting request flag (RY79).	→	8) The AJ65BT-D75P2-S3 turns OFF the initial data setting request flag (RY79).
10) Reads out the initial data setting complete flag (RX79) and the remote station READY flag (RX7B).	←	9) The AJ65BT-D75P2-S3 turns OFF the initial data setting complete flag (RX79), and turns ON the remote station READY flag (RX7B).
11) With the initial data setting complete flag (RX79) OFF and the remote station READY flag (RX7B) ON, turns ON the Axis 1 servo ON flag (RY20) and Axis 2 servo ON flag (RY40).	→	12) Turns ON the Axis 1 servo ON flag (RY20) and Axis 2 servo ON flag (RY40) of the AJ65BT-D75P2-S3.
13) Turns ON the Axis 1 positioning start flag (RY10) and Axis 2 positioning start flag (RY11).	→	14) Turns ON the Axis 1 positioning start flag (RY10) and Axis 2 positioning start flag (RY11) on the AJ65BT-D75P2-S3. The AJ65BT-D75P2-S3 starts the zero point return operation.

Parameters set in the sample program

	For zero point return	
	Basic parameters	Extended parameters
Axis 1	Zero point return method: 5 (counting system 2 (zero-point signal is not used)) Zero point return direction: 0 (forward direction) Zero point address: 0 Zero point return speed: 2000 Creep speed: 1000 Zero point return retry: 0 (no retry)	Zero point return dwell time: 0 Displacement setting after near-point dog: 1000 Zero point return acceleration time selection: 0 Zero point return deceleration time selection: 0 Zero point shift amount: 0 Zero point return torque limit value: 300 Speed designation during zero point shift: 0 Dwell time during zero point return retry: 0
Axis 2	Zero point return method: 5 (counting system 2 (zero-point signal is not used)) Zero point return direction: 0 (forward direction) Zero point address: 0 Zero point return speed: 2000 Creep speed: 1000 Zero point return retry: 0 (no retry)	Zero point return dwell time: 0 Displacement setting after near-point dog: 1000 Zero point return acceleration time selection: 0 Zero point return deceleration time selection: 0 Zero point shift amount: 0 Zero point return torque limit value: 300 Speed designation during zero point shift: 0 Dwell time during zero point return retry: 0

14.4.3 Positioning control

The following shows the relation between the user program on the PC and intelligent device station's I/O operations, and positioning control.
(The shaded areas indicate the devices that are actually used.)



*1: When the remote net Ver.2 mode is selected, refer to the figure in Section 4.4.7 (1).
When the remote net additional mode is selected, refer to the figure in Section 4.4.7 (2).

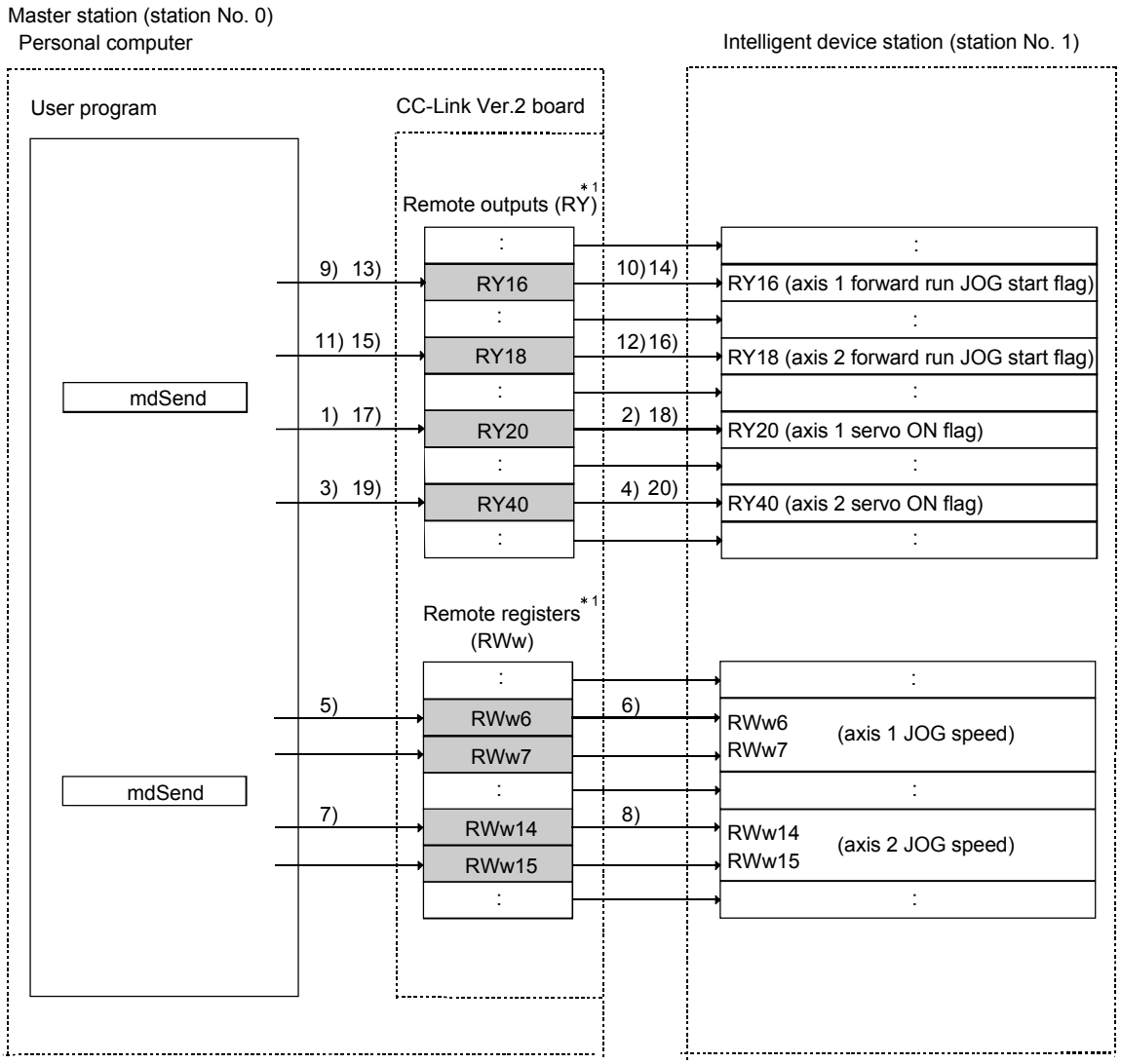
User Program	CC-Link Ver.2 Board
1) Turns ON the Axis 1 servo ON flag (RY20) and the Axis 2 servo ON flag (RY40). →	2) Turns ON the Axis 1 servo ON flag (RY20) and the Axis 2 servo ON flag (RY40) on the AJ65BT-D75P2 -S3.
3) Writes start No. to the Axis 1 positioning start No. setting area (RWw0) and Axis 2 positioning start No. setting area (RWw8). →	4) Writes the start No. to the Axis 1 positioning start No. setting area (RWw0) and Axis 2 positioning start No. setting area (RWw8) on the AJ65BT-D75P2-S3.
5) Turns ON the Axis 1 positioning start flag (RY10) and Axis 2 positioning start flag (RY11). →	6) Turns ON the Axis 1 positioning start flag (RY10) and Axis 2 positioning start flag (RY11) on the AJ65BT-D75P2-S3. The AJ65BT-D75P2-S3 starts zero point return operation.
	7) The AJ65BT-D75P2-S3 starts positioning operations for axes 1 and 2, and turns ON the Axis 1 start complete flag (RX01), Axis 1 BUSY flag (RX04), Axis 2 start complete flag (RX02) and Axis 2 BUSY flag (RX05).
9) Reads out the Axis 1 BUSY flag (RX04) and Axis 2 BUSY flag (RX05). ←	8) When positioning of Axis 1 or 2 is completed, the AJ65BT-D75P2-S3 turns OFF the Axis 1 BUSY flag (RX04) or Axis 2 BUSY flag (RX05) respectively.
10) With the Axis 1 BUSY flag (RX04) OFF, turns OFF the Axis 1 positioning start flag (RY10). With the Axis 2 BUSY flag (RX05) OFF, turns OFF the Axis 2 positioning start flag (RY11). →	11) Turns OFF the Axis 1 positioning start flag (RY10) and Axis 2 positioning start flag (RY11) on the AJ65BT-D75P2-S3.
13) Reads out the Axis 1 start complete flag (RX01) and Axis 2 start complete flag (RX02). ←	12) The AJ65BT-D75P2-S3 turns OFF the Axis 1 start complete flag (RX01) and Axis 2 start complete flag (RX02).
14) With the Axis 1 start complete flag (RX01) OFF, turns OFF the Axis 1 servo ON flag (RY20). With the Axis 2 start complete flag (RX02) OFF, turns OFF the Axis 2 servo ON flag (RY40). →	15) Turns OFF the Axis 1 servo ON flag (RY20) and Axis 2 servo ON flag (RY40) on the AJ65BT-D75P2-S3.

Parameters set in the sample program

		For zero point return
Axis 1	No. 1	Positioning identifier setting: 0x200 (INC linear 1) M code setting: 0 Dwell time: 0 Command speed: 0x30D40 (20000) Positioning address: 1000 Arc address: 0
Axis 2	No. 1	Positioning identifier setting: 0x200 (INC linear 1) M code setting: 0 Dwell time: 0 Command speed: 0x30D40 (20000) Positioning address: 1000 Arc address: 0

14.4.4 JOG operation control

The following shows the relation between the user program on the PC and intelligent device station's I/O operations, and jog operation control.
(The shaded areas indicate the devices that are actually used.)



*1: When the remote net Ver.2 mode is selected, refer to the figure in Section 4.4.7 (1).
When the remote net additional mode is selected, refer to the figure in Section 4.4.7 (2).

User Program		CC-Link Ver.2 Board
1) Turns ON the Axis 1 servo ON flag (RY20).	→	2) Turns ON the Axis 1 servo ON flag (RY20) on the AJ65BT-D75P2-S3.
3) Turns ON the Axis 2 servo ON flag (RY40).	→	4) Turns ON the Axis 2 servo ON flag (RY40) on the AJ65BT-D75P2-S3.
5) Writes the JOG speed to the Axis 1 JOG speed setting area (RWw6, RWw7).	→	6) Writes the JOG speed to the Axis 1 JOG speed setting area (RWw6, RWw7) of the AJ65BT-D75P2-S3.
7) Writes the JOG speed to the Axis 2 JOG speed setting area (RWw14, RWw15).	→	8) Writes the JOG speed to the Axis 2 JOG speed setting area (RWw14, RWw15) of the AJ65BT-D75P2-S3.
9) Turns ON the Axis 1 forward run JOG start flag (RY16).	→	10) Turns ON the Axis 1 forward run JOG start flag (RY16) of the AJ65BT-D75P2-S3, and starts JOG operation.
11) Turns ON the Axis 2 forward run JOG start flag (RY18).	→	12) Turns ON the Axis 2 forward run JOG start flag (RY18) of the AJ65BT-D75P2-S3, and starts JOG operation.
13) To stop JOG operation of Axis 1, turn OFF the Axis 1 forward run JOG start flag (RY16).	→	14) Turn OFF the Axis 1 forward run JOG start flag (RY16) of the AJ65BT-D75P2-S3 to stop the JOG operation.
15) To stop JOG operation of Axis 2, turn OFF the Axis 2 forward run JOG start flag (RY18).	→	16) Turn OFF the Axis 2 forward run JOG start flag (RY18) of the AJ65BT-D75P2-S3 to stop JOG operation.
17) Turns OFF the Axis 1 servo ON flag (RY20).	→	18) Turns OFF the Axis 1 servo ON flag (RY20) of the AJ65BT-D75P2-S3.
19) Turns OFF the Axis 2 servo ON flag (RY40).	→	20) Turns OFF the Axis 2 servo ON flag (RY40) of the AJ65BT-D75P2-S3.

14.5 Executing the Data Link

To start the data link, first power on the intelligent device station, and then the master station.

14.5.1 Checking the data link status

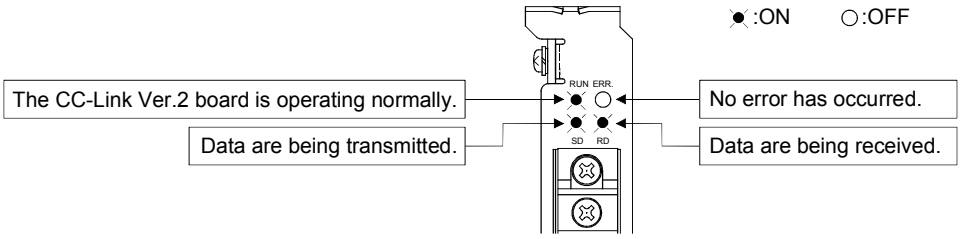
The following describes how to check the operation status of the master station and intelligent device stations under normal data link condition.

(1) Checking the master station

Check the operation status of the master station.

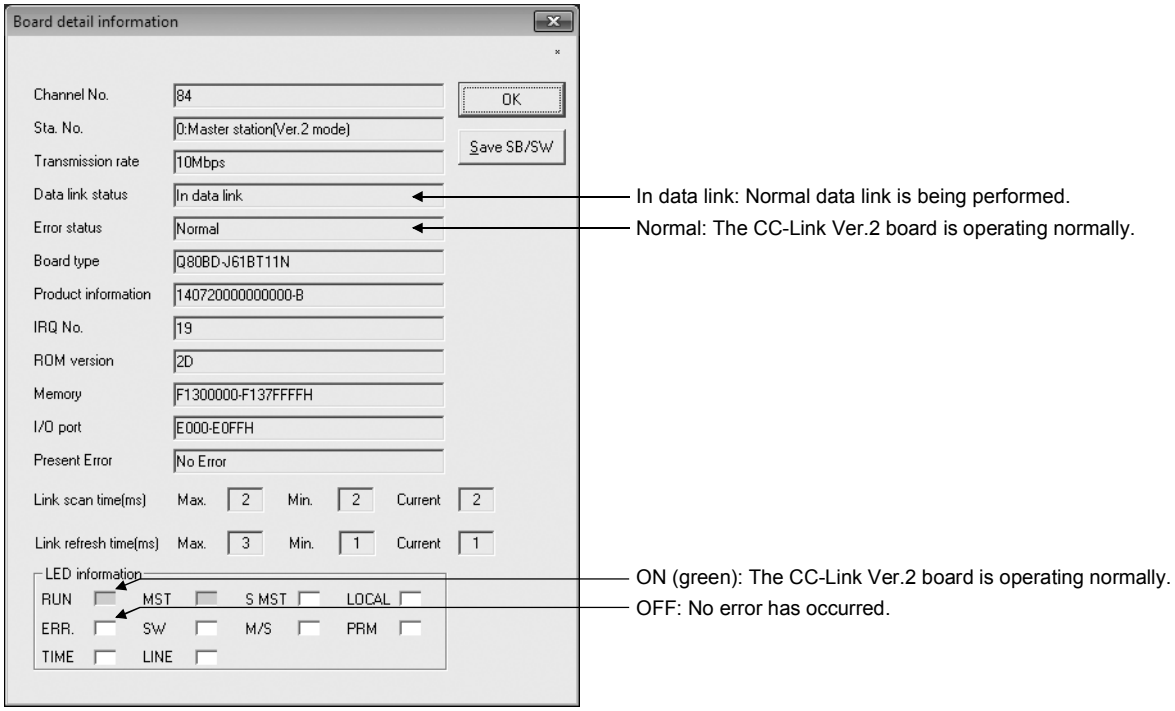
(a) Checking by the LED indication on the CC-Link Ver.2 board

Make sure that the LED status is as follows:



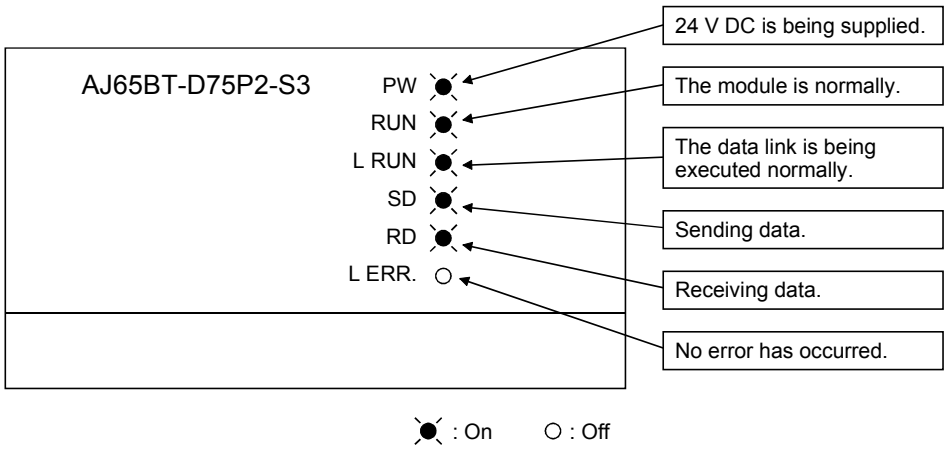
(b) Checking by the CC-Link Ver.2 Utility

Check that the Board detail information on the CC-Link Ver.2 Utility is displayed as shown below.


Board detail information
Channel No. 84
Sta. No. 0:Master station(Ver.2 mode)
Transmission rate 10Mbps
Data link status In data link
Error status Normal
Board type Q80BD-J61BT11N
Product information 140720000000000-B
IRQ No. 19
ROM version 2D
Memory F1300000-F137FFFFH
I/O port E000-E0FFH
Present Error No Error
Link scan time(ms) Max. 2 Min. 2 Current 2
Link refresh time(ms) Max. 3 Min. 1 Current 1
LED information
RUN MST S MST LOCAL
ERR. SW M/S PRM
TIME LINE
OK
Save SB/SW
In data link: Normal data link is being performed.
Normal: The CC-Link Ver.2 board is operating normally.
ON (green): The CC-Link Ver.2 board is operating normally.
OFF: No error has occurred.

(2) LED displays of the Intelligent device station

Be sure that the LED displays show the following status:



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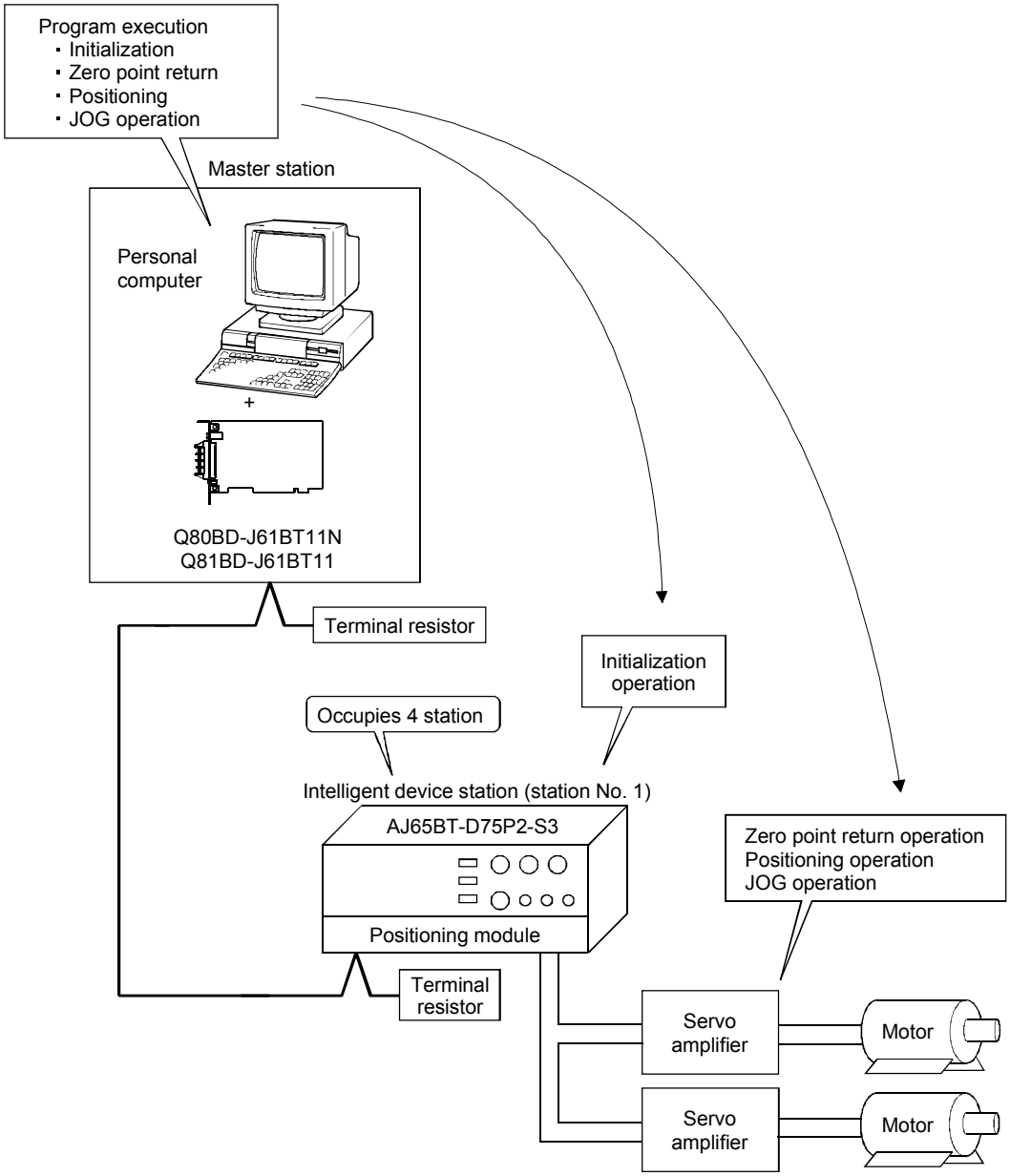
14.5.2 Confirming the operation with a user program

Using a user program, confirm that the data link is being executed normally.
Use of the sample program allows the operation check in the following system configuration.
For details on the location where the sample program is stored, refer to MELSEC Data Link Library Reference Manual.
With the sample program, the initialization, zero point return, positioning and jog operation can be performed.



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15 ERROR CODE

The following table shows the error codes.
For error codes which are not listed in this section, refer to the following manuals.
• MELSEC Data Link Library Reference Manual
• CC-Link System Master/Local Module User's Manual

Error code (hexadecimal)	Error description	Cause of error (details)	Corrective action	Detectability	
				Master station	Local station
B110	Cannot receive messages.	A line error has occurred.	Check the line.	○	○
B111	Message data receiving order error	A line error has occurred.	Check the line.	○	○
B112	Message data length error	A line error has occurred.	Check the line.	○	○
B113	Message data ID error	A line error has occurred, or an instantaneous power failure has occurred in the send station.	Check the line, power supply for the send station or power supply module.	○	○
B114	Link error	A line error has occurred.	Check the line.	○	○
B115	Link error	A line error has occurred.	Check the line.	○	○
B116	Abnormal head bit	A line error has occurred.	Check the line.	○	○
B201	Corresponding station error during sending	A data link error occurred in the corresponding station during transient transmission.	Check the communication status of other stations, whether or not a temporary error invalid station is designated, or if the own station is stopped.	○	○
B205	Transient target station error	A transient request was issued to other than the intelligent device station.	Check the target station.	○	○
B301	Processing request error during link stop	A line test request was issued while the link was stopped.	Perform a line test during link startup.	○	○
B302	Designated station number setting error	The designated station number exceeded the maximum communication station number during temporary error invalid request/temporary error invalid cancel request.	Designate a station number that is no greater than the maximum communication station number.	○	×
B303	Designated station number not set error	The designated station numbers were not set during temporary error invalid request/temporary error invalid cancel request.	Set station numbers to designate. (SW0003, SW0004 to SW0007)	○	×
B304	Line test error station detected	An error was detected in a remote station or an intelligent device station while executing a line test.	Check whether the remote station and the intelligent device station are started and the cable is connected properly.	○	×
B306	Designated station number setting error	A station number other than the head station was designated by a temporary error invalid request/temporary error invalid cancel request.	Designate the head station by a temporary error invalid request/temporary error invalid cancel request.	○	○
B307	All stations data link error	All stations were in data link error status when either of the following requests was made: • SB0000 (data link restart) • SB0002 (data link stop)	Request again after the data link becomes normal.	○	○
B308	Station number setting error (installation status)	The station number of the slave station is outside of the range between 1 and 64.	Set the station number of the slave station within the range between 1 and 64.	○	×
B309	Duplicate station number error	A duplicate station number was specified for the connected board/ module (including the number of occupied stations). However, this excludes the duplicate head station numbers.	Check the board/module station number.	○	×

Error code (hexadecimal)	Error description	Cause of error (details)	Corrective action	Detectability	
				Master station	Local station
B30A	Installation/parameter mismatching error	The station types of the module are different from the parameter settings. Example) Connected module: Parameter setting Remote device: Remote I/O Intelligent device: Remote I/O / Remote device	Set the correct parameters.	○	×
B30B	Installation/parameter mismatching error	The contents of the installation status and network parameters do not match.	Match the contents of the installation status and network parameters.	○	×
B30C	Standby master station designation error	Master station switching was directed to a station other than the standby master station.	Designate the station number of the standby master station.	○	○
B30D	Temporary error invalid station designation error	A temporary error invalid station was designated before the link was started.	Designate a temporary error invalid station during data link.	○	×
B384	Station number setting error (parameter)	The station number (including the number of occupied stations) was set to a value "other than 1_H to 40_H with a station information parameter (addresses 20_H to $5F_H$).	Set the station number within the range from "1_H to 40_H."	○	×
B385	Total number of stations error (parameter)	The total number of occupied stations set with a station information parameter (addresses 20_H to $5F_H$) exceed "64."	Set a value of "64 or less."	○	×
B386	Number of occupied stations setting error (parameter)	The number of all occupied stations was set to "0" with a station information parameter (addresses 20_H to $5F_H$).	Set the occupied station number between "1 and 4."	○	×
B387	Use prohibited area write error	A write operation was performed to a use prohibited area (not used) in the buffer memory.	Do not write to any of the use prohibited areas (not used) in the buffer memory.	○	○
B388	Station type setting error	The station type was set to a value "other than 0 to 2" with a station information parameter (addresses 20_H to $5F_H$).	Set the parameter within the range from "0 to 2."	○	×
B389	Use prohibited area write error	A write operation was performed to a use prohibited area (not used) in the buffer memory.	Do not write to any of the use prohibited areas (not used) in the buffer memory.	○	○
B38B	Remote device station setting error (parameter)	The number of remote device stations was set to "43 stations or more" with a station information parameter (addresses 20_H to $5F_H$).	Set the number of remote device stations to "42 stations or less."	○	×
B38C	Intelligent device station setting error (parameter)	The number of intelligent device stations (including local stations) was set to "27 stations or more" with a station information parameter (addresses 20_H to $5F_H$).	Set the number of intelligent device stations to "26 stations or less."	○	×
B38D	Invalid station designation error (parameter)	The invalid station designation parameter (addresses 14_H to 17_H) was set to a value "other than board/ module's head station number" or "station number not specified in the parameter." <Example of other than head station number> A bit other than for station number 5 was on for a module occupying 4 stations (station numbers 5 to 8).	Set the head station number of the target station. Do not designate any of the stations not specified with a parameter.	○	×

Error code (hexadecimal)	Error description	Cause of error (details)	Corrective action	Detectability	
				Master station	Local station
B38E	Communication buffer assignment error	The total size of the communication buffer set with a station information parameter (addresses 20_H to $5F_H$) exceeded 4 k words.	Set the total size of the communication buffer to 4 k words or less.	○	○
B38F	Automatic update buffer assignment error	The total size of the automatic update buffer set with a station information parameter (addresses 20_H to $5F_H$) exceeded 4 k words.	Set the total size of the automatic update buffer to 4 k words or less.	○	○
B390	Standby master station designation error (parameter)	The standby master station designation parameter (address 4_H) was set to a value "other than 1 to 64."	Set the standby master station to a value within the range from "1 to 64."	○	○
B391	Number of retries setting error (parameter)	The number of retries setting parameter (address 2_H) was set to a value "other than 1 to 7."	Set a value within the range from "1 to 7."	○	×
B394	Number of auto return stations setting error (parameter)	The number of auto return stations setting parameter (address 3_H) was set to a value "other than 1 to 10."	Set a value within the range from "1 to 10."	○	×
B396	Station number duplicate error (parameter)	A duplicate station number was set with a station information parameter (addresses 20_H to $5F_H$).	Set the parameter so that station numbers are not duplicated.	○	×
B397	Station data setting error (parameter)	The station information parameter (addresses 20_H to $5F_H$) setting does not satisfy the following condition: $(16 \times 4) + (54 \times B) + (88 \times C) \leq 2304$ A: Number of remote I/O stations B: Number of remote device stations C: Number of intelligent device stations (including local stations)	Set the parameter so that it satisfies the condition shown at the left.	○	×
B398	Number of occupied stations setting error (parameter)	The number of occupied stations in a station information parameter (addresses 20_H to $5F_H$) was set to a value "other than 1 to 4."	Set a value within the range from "1 to 4."	○	×
B399	Number of connected modules setting error (parameter)	The number of connected modules parameter (address 1_H) was set to a value "other than 1 to 64."	Set a value within the range from "1 to 64."	○	×
B39A	Standby master station designation error (installation status)	The condition setting switch for the station number not specified with a parameter is designated for the standby master station.	Check the parameter or condition setting switch.	×	○
B39B	Reserved station designation error (parameter)	All stations were set as reserved stations with a parameter.	Check the parameter's reserved station setting.	○	×
B39C	Standby master station setting error	A station number specified as a standby master station is set to a station other than an intelligent device station.	Specify the standby master station as an intelligent device station.	○	×
B401	Parameter change error	A parameter change was executed during a transient request.	Change the parameter after all transient requests are completed or before any are requested.	○	○
B404	Response error	A response from the requesting station was not returned within the monitor time period.	Set a longer monitor time setting value. If an error persists, check the requesting station and cables.	○	○
B405	Transient target station error	A transient request was issued to a remote I/O station or remote device station.	Set the target station to a local station or intelligent device station.	○	○
B406	RY simultaneous on error	A request was issued without turning RY on/RY off before the response is completed.	Always turn RY off and then issue a request after the response is completed.	○	○

Error code (hexadecimal)	Error description	Cause of error (details)	Corrective action	Detectability	
				Master station	Local station
B407	Transient communication number mismatch error	The numbers for request data and response data do not match.	Check the line.	○	○
B510	Sending channel in use (own station)	The selected channel is already in use.	The same channel cannot be used at the same time. Change the channel number or try not to use the same channel at the same time.	○	○
B511	Receiving channel in use	The channel of the target station is already in use.	Execute the mdSend instruction after a while. Check to see if more than one request is made to the channel of the target station from own station and/or multiple stations.	○	○
B512	Arrival wait timeout	The arrival monitor time has exceeded (when the resend count is 0) or the mdReceive instruction was executed when the mdReceive instruction execution request flag was not turned on.	Increase the arrival monitor time if this error occurred in the mdReceive instruction and when another station was executing the SEND instruction (mdSend instruction in case of the CC-Link Ver.2 board). Increase the arrival monitor time when own station was executing an instruction. If the error persists, check the network and target station.	○	○
B513	Number of retries exceeded	The number of retries exceeded the set number.	Increase the arrival monitor time. If the error persists, check the network and target station.	○	○
B515	Channel number error	A channel number is out of the setting range.	Set the channel of own station and target station to "1 or 2."	○	○
B519	Resend count error	The number of resends is out of the setting range.	Set a value in the range from "0 to 15 (times)."	○	○
B51A	Arrival monitor time error	The arrival monitor time is out of the setting range.	Set a value in the range from "0 to 32767 (seconds)."	○	○
B520	Target station number error	"Other than 0" is set for the target station number.	Set the target station number to "0."	○	○
B524	Target station CPU error	The target station's CPU is faulty.	Check the target station's CPU.	○	○
B601	Access code setting error	Nonexistent access code/attribute was set.	Set the correct access code/attribute.	○	○
B602	Transient request overload error	There are too many transient requests to the corresponding station.	Wait a while and then send the requests (transient transmission overload status).	○	○
B603	Transient request overload error	There are too many transient requests to the corresponding station.	Wait a while and then send the requests (transient transmission overload status).	○	○
B604	Line test in progress	A transient transmission was performed while a line test was in progress.	Wait a while and then resend.	○	×
B605	Cannot access the communication buffer.	Access to the communication buffer failed.	Wait a while and then resend.	○	○
B607	Target station CPU error	There is an error in the target station's CPU.	Check the target CPU.	○	○
B771	Transient request overload error	There are too many transient requests to the corresponding station (when the requesting station is the AJ65BT-G4, A8GT-J61BT13 or CC-Link Ver.2 board).	Wait a while and then resend (transient transmission overloaded status).	○	○

Error code (hexadecimal)	Error description	Cause of error (details)	Corrective action	Detectability	
				Master station	Local station
B774	Transient request error	The target station was not an intelligent device station (when the requesting station is the A8GT-J61BT13 or CC-Link Ver.2 board).	Check if the target station is an intelligent device station.	○	○
B778	Response timeout	A response was not received from the requested station (when the requesting station is the A8GT-J61BT13 or CC-Link Ver.2 board).	Check the requested module and cables.	○	○
B780	Module mode setting error	A transient transmission was executed even though the target station was set in the I/O mode.	Set the target station in the intelligent mode.	○	○
B801	Access code setting error	An access code/attribute that does not exist was set.	Set the correct access code/ attribute.	○	○
B802	Access code error	An access code that does not exist was used.	Use the correct access code.	○	○
B803	Number of data points error	The number of data points is out of range.	Set the number of data points to a value in the range from "1 to 960 bytes."	○	○
B804	Attribute definition error Specification error of the station not supported transit transmission	Invalid attribute definition, or transient transmission was executed although the target station does not support transient transmission.	Review the attribute definition. Review the specified content of the target station number. Or, check the function version and software version of the target local station.	○	○
B805	Number of data error	The number of data is out of rage.	Set the number of data to a value in the range from "1 to 100" when writing, and "1 to 160" when reading.	○	○
B807	Address definition error	The address was not a multiple of 16 when a bit device was accessed.	Set the address to a multiple of 16 when accessing a bit device.	○	○
B80D	Setting range error	The combination of the set address and number of points exceeded the valid processing range.	Set so that the number of processing points does not exceed the device range.	○	○
B814	File register capacity setting error	The file register capacity was not set.	Set the file register capacity.	○	○
B815	Module mode setting error	A transient transmission was executed even though the target station was set in the I/O mode.	Change it to the intelligent mode.	○	○
B901	E^2PROM error	When a parameter registration request (YnA) to E^2PROM was executed, the E^2PROM was faulty or the write limit (10,000 times) was exceeded.	Replace the module.	○	×
B902	Data link startup error with E^2PROM parameters	A data link startup request (Yn8) using an E^2PROM parameter was executed even though the parameter has not been registered in the E^2PROM.	Register the parameter to E^2PROM with a parameter registration request (YnA).	○	×
B903	Transient request error	A transient request was issued to a station that has not allocated a communication buffer area.	Allocate a communication buffer area with a parameter.	○	○
B904	Communication buffer size setting error	The communication buffer size of the corresponding station was out of range when a dedicated instruction was executed.	Set the communication buffer size of the corresponding station within the range.	○	○
B905	Transient data length error	The transient data was longer than the communication buffer size of the corresponding station when a dedicated instruction was executed.	Make the communication buffer size of the corresponding station larger than the transient data length.	○	○
BA19	Corresponding station error	The corresponding station that is being tested stopped communication during line test.	Check the cable and the corresponding station.	○	×

Error code (hexadecimal)	Error description	Cause of error (details)	Corrective action	Detectability	
				Master station	Local station
BA1B	All stations error	All stations stopped communications during line test.	Check the cables.	○	×
BBC1	Mode setting error	The mode setting of a local station is not set to "1."	Set "0."	×	○
BBC2	Station number setting error	The station number setting is set to a value "other than 0 to 64."	Set the value within the range from "0 to 64."	○	○
BBC3	Transmission rate setting error	The transmission rate setting is set to a value "other than 0 to 4."	Set the value within the range from "0 to 4."	○	○
BBC5	Master station duplicate error	A master station already exists.	Review the station number setting switch.	○	×
BBC7	Module error	The module is faulty.	Replace the module.	○	○

16 TROUBLESHOOTING

This section explains the identification of the causes and troubleshooting when an error occurred.

(1) Basic checking procedure

Check if there is a corresponding error symptom written in "Verification of problem occurrence" (Section 16.1).

If the corresponding error could not be found, check the cause by following the procedure shown below.

1. Check if all the boards installed on a personal computer are displayed with the utility.
   - Check on the Board information screen (Refer to Section 8.2.2)
   - Check on the Event Viewer screen (Refer to Section 16.3.2)
   - Check on the Device Manager screen (Refer to Section 16.3.3)
2. Check the LED display of the board.
   - Check the LED status (Refer to Section 5.2)
3. Check the error occurring at the utility.
   - Check on the Board information screen (Refer to Section 8.2.2)
   - Check the status of stations on the Other station monitor screen (Refer to Section 8.2.3)
   - Check with test (Refer to Section 8.2.8)
4. Check the access target device.
   - Check if the board operates as set to the parameter or program by checking whether the link devices perform communication, or transient send/receive performs normally with the device monitor utility (Refer to Section 8.3)
5. Check the user program.
   - Check the arguments and returned values of the communication function (Refer to MELSEC Data Link Library Reference Manual)

(2) When error cannot be solved

If the troubleshooting above does not help, refer to Section 16.7.

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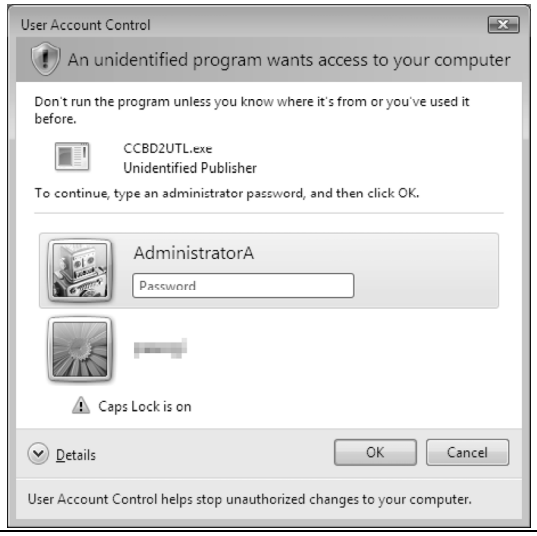
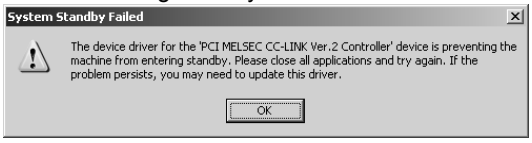
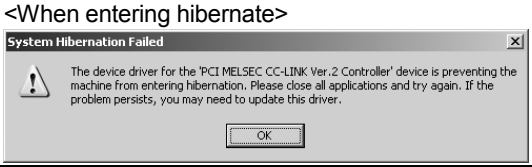
16.1 Verification of Problem Occurrence

When a problem occurs on the CC-Link Ver.2 board, check the following error details to find the appropriate section to go to.

(1) Problem for software package installation

No.	Error detail	Cause determination method/Corrective action
1	The software is not normally installed.	Refer to Section 16.2.1.
2	Uninstallation is not executed normally.	Refer to Section 16.2.2.
3	The driver is not normally installed. A " ! " mark is displayed next to the icon of the driver on the Device Manager screen.	Refer to Section 16.3.3.

(2) Problem for a personal computer and utility

No.	Error detail	Cause determination method/Corrective action
1	The personal computer does not start/down	Refer to Section 16.3.
2	Error message "An error occurred in writing." is displayed in utility	Logon as a user with administrator authority and execute utility or reinstall the operating system.
3	The password is requested on the User Account Control screen when the utility is activated. <Using Windows Vista® /Windows® 2008 / Windows® 7> 	When the utility is activated, and if the User Account Control screen is displayed requesting a selection of user with administrator authority and password entry ∗1, the user who is logging on to the system does not have an administrator authority. Log off the system and login again as a user with administrator authority, and activate the utility. ∗2
4	System standby or hibernate error is displayed. <When entering standby>  <When entering hibernate> 	The power save mode (standby, hibernate) of operating system is not supported for CC-Link Ver.2 board. Configure the settings of the "Power Options" in the control panel to avoid the computer from activating the power save mode (stand by, hibernate). Check the setting for when the computer's power button is pressed, and the settings of the uninterruptible power supply system (UPS).

No.	Error detail	Cause determination method/Corrective action
5	The utility screen is not displayed properly. The operations of utility cannot be performed.	1) Check if the display settings on the [Device Manager] or other relevant functions are correct, and install an appropriate display driver. Or update the Windows® operating system. 2) Close the other applications. 3) Change the Hardware accelerator setting of the display setting.
6	Measures for Slow Personal Computer Operation • Response of mouse or keyboard is slow. • Operating speed of another application is slow. • CPU utilization of personal computer is high.	Refer to Section 16.6.

∗1: If only one user account with administrator authority is available, the User Account Control screen requests the password entry of its user only.

∗2: For details on how to prevent this screen from being displayed, refer to Appendix 15.

(3) Problem for a board and driver

No.	Error detail	Cause determination method/Corrective action
1	The driver does not start.	1) Install the board. 2) Check if the board is recognized normally on the Device Manager screen. (refer to section 16.3.3) 3) When the board is recognized normally on the Device Manager screen, check if an error has been occurred on the Event Viewer screen. (Refer to Section 16.3.2)
2	Board WDT error has occurred	Refer to Section 16.4.1.
3	Driver WDT error has occurred	Refer to Section 16.4.2.
4	RUN LED has been flashing	Refer to Section 16.4.3.

(4) Problem for network access

No.	Error detail	Cause determination method/Corrective action
1	The data link cannot be performed normally as CC-Link system.	Refer to Section 16.5.1.
2	ERR. LED of the master station has been flashing.	Refer to Section 16.5.2.
3	CPU modules other than QCPU cannot be accessed.	CPU modules other than QCPU (Q mode) cannot be accessed to the 64-bit version of user application. Use 32-bit version of user application.

16.2 Troubleshooting for Installation and Uninstallation

The following explains the troubleshooting for error at installation and uninstallation.

16.2.1 Installation failed

When the installation is aborted or failed, reinstall the utility by the following procedure.

1. Check the installation and uninstallation precautions. (Refer to Section 7.1)
2. Restart the personal computer.
3. If the utility can be uninstalled, uninstall it.
   After the uninstallation, restart the personal computer.
4. Install the utility again by following the installation procedure. (Refer to Section 7.2)
   When the instruction displayed on the screen is not effective, refer to Section 16.2.3.
5. If the personal computer does not operate normally after the reinstallaion, check if the personal computer has any problem.
   • Operating Environment (Refer to Section 2.3)
   • Checking personal computer and operating system (Refer to Section 16.3.1)

If the troubleshooting above does not help, refer to Section 16.7.

16.2.2 Uninstallation failed

When the uninstallation is failed, uninstall the utility after the reinstallation by the following procedure.

1. Check the installation and uninstallation precautions. (Refer to Section 7.1) If the creation of 8.3 filename is disabled, perform the operation (1) in this section.
2. Insert the CD-ROM in the CD-ROM drive.
3. Display the "Run" screen from the Start menu or Quick Access Menu of Windows® .
4. Append "-A" and execute "Disk1\Setup.exe" of the CD-ROM.
5. Install the utility again by following the installation procedure (refer to Section 7.2).
6. Perform the uninstallation.
7. If the utility cannot be uninstalled normally, check if the personal computer has any problem.
   • Operating Environment (Refer to Section 2.3)
   • Checking personal computer and operating system (Refer to Section 16.3.1)

If the troubleshooting above does not help, refer to Section 16.7.

(1) Operation for the creation of 8.3 filename is disabled

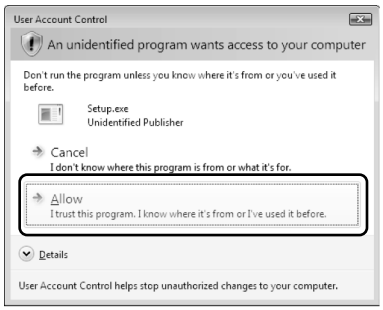
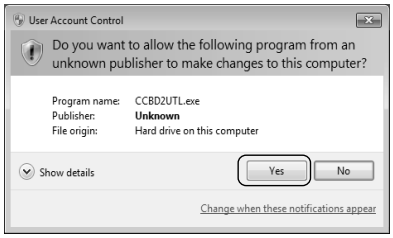
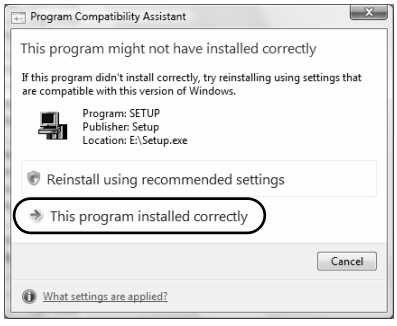
1. Enable the creation of 8.3 filename.
2. Insert the CD-ROM in the CD-ROM drive.
3. Display the "Run" screen from the Start menu or Quick Access Menu of Windows ®.
4. Append "-G" and execute "Disk1\Setup.exe" on the CD-ROM.
5. Perform the uninstallation.

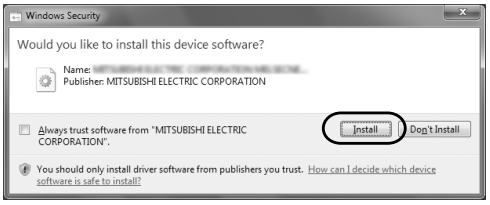
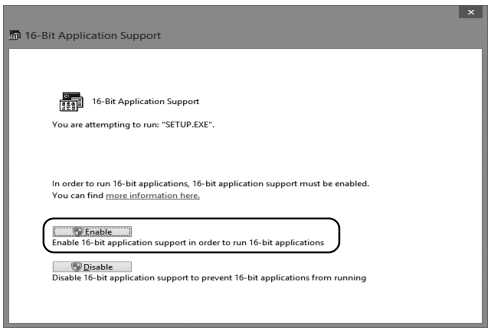
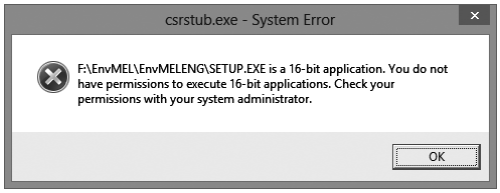
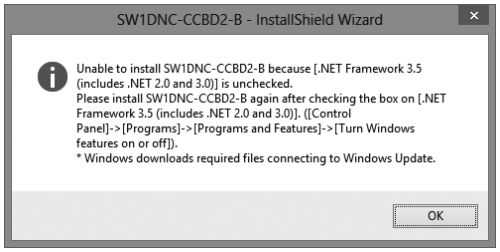
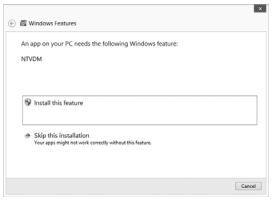
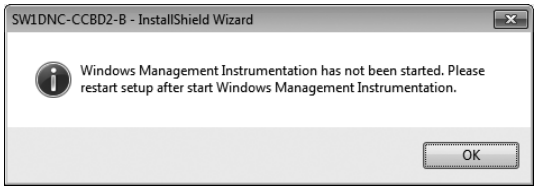
POINT
The option to append "-G" to Setup.exe is supported only by SW1DNC-CCBD2-B Version 1.15R or later.

16.2.3 When the instruction displayed on the screen is not effective at installation

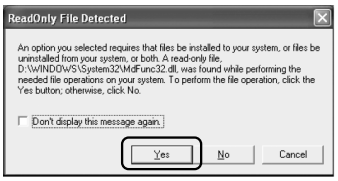
The following table shows the instruction when the screen is displayed.

(1) Windows Vista® /Windows Server® 2008/Windows Server® 2008 R2/Windows® 7/Windows Server® 2012/Windows Server® 2012 R2/Windows® 8/Windows® 8.1

Screen	Instruction
 	This screen appears when user account control is enabled. Click "Allow" or the [Yes] button.
	Click the [Yes] button. MELSECPowerManager is installed and the Windows® Power Options settings are changed automatically. For details of MELSECPowerManager, refer to Appendix 17.
	If this screen is displayed during the installation or at the installation completion, click "This program installed correctly". If this screen is displayed when the installation is aborted, click the [Cancel] button and close the screen. Do not select "Reinstall using recommended settings". An incorrect module may be installed.
	Click "Install this driver software anyway"

Screen	Instruction
	Confirm the publisher is "MITSUBISHI ELECTRIC CORPORATION", and click the Install button. This screen may be displayed a couple of times.
	When installing "Environment of MELSOFT", this screen may be displayed. Click the Enabled button.
	"Environment of MELSOFT" is a 16-bit application. Execute "\EnvMEL\EnvMELENG\SETUP.EXE" in the CD-ROM after searching "16-bit Application Support" on the control panel and setting to "Enable".
	The message is displayed when .NET Framework 3.5 (including .NET 2.0 and 3.0) is set to disabled. Reinstall the utility after searching the "Turn Windows features on or off" on the control panel and enabling the function of ".NET Framework 3.5 (including .NET 2.0 and 3.0)". The procedure when .NET Framework 3.5 (including .NET 2.0 and 3.0) is disabled is the same procedure as MELSOFT products. For details of the procedure, refer to the technical bulletin FA-A-0153.
	Select "Install this feature".
	Displays when Windows Management Instrumentation service is stopped in Windows® 7 and Windows Server® 2008 R2. Open the "Service" screen from [Control Panel] -> [Administrative Tools], right-click the "Windows Management Instrumentation", and then select the "Start" from the menu. After starting the Windows Management Instrumentation, execute the setup again.

(2) Windows® XP/Windows Server® 2003 R2

Screen	Instruction
	Click the Yes button.
	This screen is displayed at the first installation. Click the Continue Anyway button. The operation test has been conducted by Mitsubishi. (Problems do not occur after the installation.) The following screen may appear behind another screen. Then, press the Alt + Tab keys to bring it to the front.
 	For Windows Server® 2003 R2, one of the screens shown on the left is displayed at the first installation. Click the Yes button.
	For Windows Server® 2003 R2, the screen shown on the left is displayed Click the Yes button and continue the installation.
	For Windows Server® 2003 R2, the screen shown on the left is displayed Click the Yes button and continue the installation.

Screen	Instruction
	For operating system of Windows® XP Service Pack2 or later, the confirmation screen for connection to Windows® Update may be displayed. Select "No, not this time" and click the Next button.
	The "Found New Hardware Wizard" screen is displayed after the board installation. Refer to Section 16.2.4 and install the driver. When the utility has been started up, restart the utility after installing the driver.

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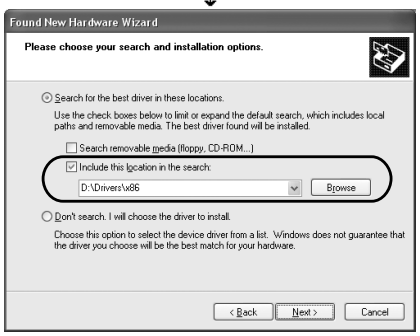
16.2.4 When the driver is not installed

The driver is installed automatically when installing the board on the personal computer after installing the software package.
For Windows XP® and Windows Server® 2003 R2, the following operation is required.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
Network Controller
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

↓


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
D:\Drivers\x86
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

1) The "Found New Hardware Wizard" screen is displayed after installing the board and starting up the personal computer.
Select "Install from a list or specific location (Advanced)" and click the Next> button.

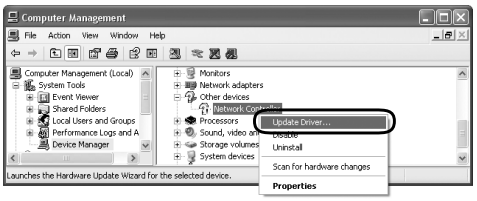
2) Select "Search for the best driver in these locations".
<For 32-bit version operating system*1>
Check "Include this location in the search" and specify "\Drivers\x86" of the CD-ROM drive to be used.
(Example: "D:\Drivers\x86")

<For 64-bit version operating system*1>
Check "Include this location in the search" and specify "\Drivers\x64" of the CD-ROM drive to be used.
(Example: "D:\Drivers\x64")

*1: The operating system can be checked by Windows system information.
For details, refer to the Microsoft® Knowledge Base.
http://support.microsoft.com/kb/827218/ (As of August 2013)

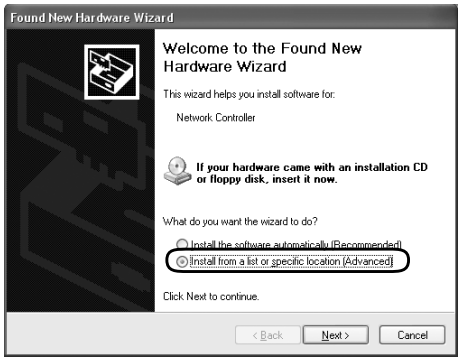
↓
(End)

When the "Found New Hardware Wizard" screen is not displayed automatically after the board installation, update the driver on the "Device Manager" screen.



↓

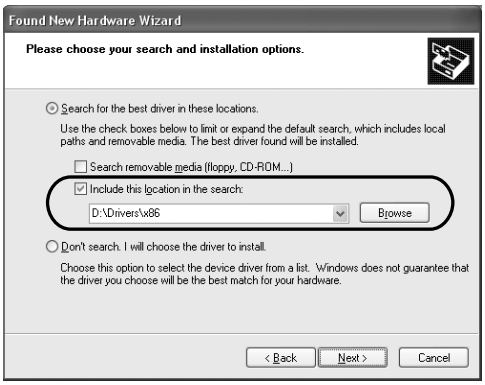
1) Open the Windows® Device Manager screen. Right-click on "Network Controller" and select "Update Driver Software".


Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
Network Controller
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

↓

2) Click "Install from a list or specific location (Advanced)".

3) Insert the CD-ROM of the software package to the CD-ROM drive.


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
D:\Drivers\x86
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

4) Specify the driver software for "Search for driver software in this location" according to the following information, and click the Next button.

<For 32-bit version operating system*1>
Specify "\Drivers\x86" of the CD-ROM drive to be used.
(Example: "D:\Drivers\x86")

<For 64-bit version operating system*1>
Check "Include this location in the search" and specify "\Drivers\x64" of the CD-ROM drive to be used.
(Example: "D:\Drivers\x64")

*1: The operating system can be checked by Windows system information.
For details, refer to the Microsoft® Knowledge Base.
http://support.microsoft.com/kb/827218/ (As of August 2013)

↓

(End)

If the troubleshooting above does not help, refer to Section 16.7.

POINT

If "Block - Never install unsigned driver software" is selected under [Control Panel] - [System] - [Hardware] - [Driver Signing], the driver may not be installed.
Select "Ignore - Install the software anyway and don't ask for my approval", or "Warn - Prompt me each time to choose an action", and install the driver.

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16.3 Troubleshooting When Personal Computer cannot be Startup or System Down Occurred

When the personal computer on which the board is installed is not started, or the system shut down or system reset is occurred, check the items following the procedure shown below.

1. Uninstall the board and check if the personal computer is started.
   • Checking personal computer and operating system (Refer to Section 16.3.1)
2. After restarting the personal computer, check if there is any error.
   • Checking on Event Viewer screen (Refer to Section 16.3.2)
3. Install the board and restart the personal computer.
   • Checking the board installation status (Refer to Section 5.3.3)
   • Checking on Device Manager screen (Refer to Section 16.3.3)

If the troubleshooting above does not help, refer to Section 16.7.

After starting the personal computer on which the board is installed, check the items following the procedure written in "Basic checking procedure" (Refer to Section 16 (1)).

(1) The system shutdown occurred when driver is uninstalled or disabled

Do not uninstall or disable the driver on the "Device Manager" screen when the board is normally recognized.
If it is uninstalled or disabled, the operating system may shut down (blue screen).

16.3.1 Checking personal computer and operating system

Check if the personal computer or operating system has any problem.

Item	Corrective action
Is the power supply ensured?	Check the power outlet and power cable of the personal computer.
Does the board operate normally if uninstall the other optional boards?	• Change the installation location of the board. • Check the resource acquisition status of other board and change the resource on the BIOS setting screen or Device Manager screen. • Reinstall the driver of the other optional boards. • Replace the other optional boards.
Does the board operate normally on another personal computer?	• Reinstall the operating system after formatting HD. • Repair or replace the personal computer.

For the problem of the personal computer or operating system, contact the personal computer or operating system manufacturer.

(1) Precautions for installing other optional board

Executing user program (including the device monitor utility) for each board simultaneously under the following condition may cause an error. When an error occurs in the user program, take the action shown below.

<Condition>

A personal computer into which the CC-Link Ver.2 board and other optional board are installed and where the resources were allocated automatically by Plug-and-Play is used.

<Action>

- Change the positions where the CC-Link Ver.2 board and other optional board are installed.
- In the BIOS setup, exchange the IRQs between the CC-Link Ver.2 board and other optional board or change their IRQs.

16.3.2 Checking on Event Viewer screen

Event logs related to the CC-Link Ver.2 board are displayed as "Mccbd2" in the Source field on the Event Viewer screen.
The following table shows the error messages that are displayed in event viewer.

Event ID (HEX)	Error message	Corrective action
256 (100_H)	Because the error had occurred in the during starting of the device, the device was not able to be executed.	Reinstall the software package. If the error persists, reinstall Operating System.
257 (101_H)	The I/F board was not found.	Uninstall and reinstall the CC-Link Ver.2 board.
258 (102_H)	There is no response from hardware.	Replace the CC-Link Ver.2 board.
259 (103_H)	The board more than the maximum number of sheets which was able to be installed was detected.	Remove the boards exceeding the maximum.
262 (106_H)	Failed to link the device name.	Check that the CC-Link Ver.1 board is not installed. Reinstall Operating System.
268 ($10C_H$)	An error occurred during the receive process.	Check the programs of the personal computer and programmable controller that requested the processing to this personal computer.
269 ($10D_H$)	An error occurred during transmission processing.	
279 (117_H)	An error occurred when Registry Database wrote out.	• Install SW1DNC-CCBD2-B, then restart the PC to confirm that this error does not occur. • Increase the system memory and disk capacities. • When the error has occurred at updating Windows ® 8.1 or upgrading the operating system with the software package installed, reinstall the software package.
280 (118_H)	The request which was not able to be processed was received from remote station.	Check the programs of the personal computer and programmable controller that requested the processing to this personal computer.
281 (119_H)	The retry transmission was generated by the transmission processing.	No corrective action for this error. (Owing to the event viewer that is generated when data are transmitted to other stations)
282 ($11A_H$)	Failed to map the I/O port.	The I/O port is also used by another resource. Remove other option boards.
283 ($11B_H$)	The Dual Port Memory Area of the I/F board conflicts with the other Hardware's one.	Remove other option boards.
284 ($11C_H$)	The IRQ of the I/F board conflicts with the other Hardware's one.	Remove other option boards.
286 ($11E_H$)	Failed to allocate the Memory Area.	Increase the system memory.
287 ($11F_H$)	Link Parameter is nothing or has abnormal data.	Reset the parameter.
288 (120_H)	Driver WDT error occurred.	Remove other option boards. Take corrective action for driver WDT error occurrence. (Refer to Section 16.4.2)
290 (122_H)	The board number of the I/F board conflicts.	Do not use duplicate board numbers.
291 (123_H)	Failed to map the Dual Port Memory.	Remove other option boards.
293 (125_H)	Failed to connect the Interrupt.	Remove other option boards.
294 (126_H)	The I/O port of the I/F board conflicts with the other hardware's one.	Remove other option boards. ∗1

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Event ID (HEX)	Error message			Corrective action
295 (127_H)	The Board WDT error had occurred. ＊3			It might be failed CC-Link Ver.2 board. Consult your local Mitsubishi representative.
296 (128_H)	The CLOCK STOP error had occurred.			
297 (129_H)	The Target Abort error had occurred on the PCI bus.			
304 (130_H)	The Data Parity error had occurred on the PCI bus.			• Restart the personal computer. • Check the board installation status. • If the board operates normally on other personal computer, the personal computer may have any problems. In this case, repair or replace the personal computer. • It might be failed CC-Link Ver.2 board. Consult your local Mitsubishi representative.
305 (131_H)	The board is not operated normally because the sleep mode, hibernation mode, and fast startup is not supported by the board.			Change the Power Option not to enter the sleep mode, hibernation mode, or disable the fast startup function and restart the personal computer.
306 (132_H)	The Board error was detected by the hardware self-diagnosis.			• Remove other option boards. • Take corrective action for driver WDT error occurrence. (Refer to Section 16.4.2) • Restart the personal computer. • Check if data is not written to the numbers not listed in the list of link special relays (SBs) and the list of link special registers (SWs). (Refer to Appendix 2) • Check the board installation status. • If the board operates normally on other personal computer, the personal computer may have any problems. In this case, repair or replace the personal computer. • It might be failed CC-Link Ver.2 board. Consult your local Mitsubishi representative.
1281 (501_H)	Initialization of the CC-Link board has failed.	DUMP value	Error description (details)	—
		01h	There was no response from hardware.	Replace the CC-Link Ver.2 board.
		67h 68h	Duplicate IRQ or memory assignment. ＊2	Remove other option boards.
		03h	There was no response from hardware.	Replace the CC-Link Ver.2 board.
		04h 21h	Handshaking with the shared memory area has failed.	Restart. If the error persists, replace the board.
		66h	There was no response from hardware.	Replace the CC-Link Ver.2 board.

DUMP value .....Value of the first 1 byte in the detailed data description area

*1: When this event error occurs on the event viewer of the operating system, change the BIOS Setup setting as follows and reboot the PC.

(BIOS Setup items)

• Plug & Play O/S: [YES] →[No]

• Reset Configuration Data: [No] → [YES]

*2: This event error may occur when the PCI bus controller is not functioning correctly.
This error may also occur if the USB driver is not functioning correctly. In this case, reinstall the USB driver and make sure that it functions correctly.

*3: This event error occurs on the event viewer by setting the hardware test mode using mdBdModSet function or executing hardware test with CC-Link Ver.2 utility.

16.3.3 Checking on Device Manager screen

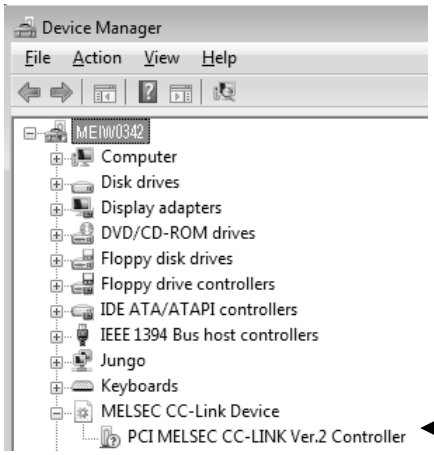
Check if the board is displayed on the Windows® Device Manager screen.

Item	Corrective action
Is the driver name of the board not displayed on the Device Manager screen?	The board or driver is not installed. • If the board is not installed, install the board. • If the board is already installed, check the board installation status and reinstall the board. • Reinstall the software package. • If the board operates normally on other personal computer, the personal computer may have any problems. In this case, repair or replace the personal computer. • If the board does not operate normally on other personal computer, replace the board.
Is "!" displayed next to the icon on the Device Manager screen?	The board installation failed. • Reinstall the software package. • Check the board installation status and reinstall the board. • If the board operates normally on other personal computer, the personal computer may have any problems. In this case, repair or replace the personal computer. • If the board does not operate normally on other personal computer, replace the board.

If any of the above corrective actions do not help, refer to Section 16.7.

Remarks

"?" is displayed next to the icon, however, the CC-LINK Ver.2 board is recognized normally.



Status after the installation of the CC-Link Ver.2 board.

POINT

Do not uninstall or disable the driver of the board on the Device Manager when the board is normally recognized. If it is uninstalled or disabled, the operating system may shut down (blue screen).

16.4 Troubleshooting for Board and Driver

16.4.1 Board WDT error

When the board WDT error occurred, check the following items.

Item	Corrective action
Is the board installed properly?	• Check the board installation status.
Does the board operate on other personal computer?	• After formatting the HD, install the operating system again. • Repair or replace the personal computer.

If any of the above corrective actions do not help, refer to Section 16.7.

16.4.2 Driver WDT error

When the driver WDT error occurred, check the following items.

Item	Corrective action
Has the error occurred due to the system overload temporarily?*1	• Reset the board. (Refer to Section 8.2.7 "Operating the Memory I/O test screen") • Restart the personal computer.
Is the same error occurred repeatedly? (Is the system overloaded constantly?)	• Remove the factor of system overload. • Disable the driver WDT function or increase the driver WDT monitoring time. (Refer to Section 8.2.5 (2) "Other settings screen")

*1: A driver WDT error may occur when the system is overloaded temporarily due to the following factors.

- Windows® start processing at the personal computer startup
- Operation of a device driver such as a graphic board
- Operation of other software applications

If any of the above corrective actions do not help, refer to Section 16.7.

16.4.3 When the RUN LED on the CC-Link Ver.2 board is flashing

The following table shows how to identify the error according to the ERR, SD or RD LED status when the RUN LED on the CC-Link Ver.2 board is flashing.

LED	Status	Error	Cause	Corrective Action
ERR.	On	OS startup error	• Breakdown or malfunction of the computer in use. ∗1 • CC-Link Ver.2 board failure. • CC-Link Ver.2 board driver is not installed. • Competition or fault with other optional board(s).	(1) Check if the CC-Link Ver.2 board driver is installed. (2) Remove the CC-Link Ver.2 board and check if the OS starts up normally. (3) Replace other optional board(s) or change installation positions for board(s). (4) Reinstall other optional board driver(s), or reset the IRQ and memory addresses. (5) Reinstall the OS, or replace the computer.
SD	On	Driver WDT error	• CC-Link Ver.2 board driver is not installed. • Driver WDT error has occurred. • CC-Link Ver.2 board failure.	(1) Check if the CC-Link Ver.2 board driver is installed. (2) Take corrective action for driver WDT. (Refer to Section 16.4.2)
RD	On	PCI bus error	• Poor contact on the CC-Link Ver.2 board • CC-Link Ver.2 board failure • Malfunction of the PC in use	(1) Check if the CC-Link Ver.2 board is firmly inserted into the PCI slot.

∗1:The error frequency may depend on the condition of the computer or OS.

If any of the above corrective actions do not help, refer to Section 16.7.

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16.5 CC-Link System Troubleshooting

This chapter describes the details of the problems that may occur in the CC-Link System. It presents a list of check items and procedures for possible problems.

16.5.1 Verification of problem occurrence

The following shows the details of check items and procedures for possible problems.

Description of problem	Check item	Check procedure
The entire system cannot perform data link.	Are there any disconnected cables?	• Check the cable connection visually or with a line test. • Check the line status (SW0090).
	Are terminal resistors connected to the terminal stations of the CC-Link system?	Connect the supplied terminal resistors to the terminal stations at both ends of the CC-Link system.
	Are the correct terminal resistors connected?	Connect the terminal resistors that match the cable type used to the terminal stations located at both ends of the CC-Link system. (Refer to Section 3.3)
	Has an error occurred in the CC-Link Ver.2 board?	Check the error code of the CC-Link Ver.2 board and take a necessary corrective action.
	Are the CC-Link parameters set for the CC-Link Ver.2 board?	Check the contents of the parameters for the CC-Link Ver.2 board.
	Has an error occurred in the master station?	• Check the own station parameter status (SW0068). • Check the switch setting status (SW006A). • Check the loading status (SW0069). • Check to see if the "ERR." LED on the master station is flashing. (Refer to Section 16.5)
Cannot receive inputs from a remote I/O station.	Is the corresponding remote I/O station performing data link?	• Check the LED displays on the corresponding remote I/O station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data read from the correct address of the remote input RX (buffer memory)?	Check the user program.
	Is the correct master station's parameter information area (CPU internal parameters, default parameters) being used?	Check the parameter information (SW0067).
	Is the corresponding remote I/O station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).

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Description of problem	Check item	Check procedure
Cannot output data from a remote I/O station.	Is the corresponding remote I/O station performing data link?	• Check the LED displays on the corresponding remote I/O station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data written to the correct address of the remote output RY (buffer memory)?	Check the user program.
	Is the correct master station's parameter information area (CPU internal parameters, default parameters) being used?	Check the parameter information (SW0067).
	Is the corresponding remote I/O station number recognized by the master station?	• Check the parameters. • Check the total number of all stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
Cannot receive the remote input RX of a remote device station.	Is the corresponding remote device station performing data link?	• Check the LED displays on the corresponding remote device station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data read from the correct address of the remote input RX (buffer memory)?	Check the user program.
	Is the correct master station's parameter information area (CPU internal parameters, default parameters) being used?	Check the parameter information (SW0067).
	Is the corresponding remote device station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
	Is the remote device station initialization procedure registration being executed?	Check if the remote device station initialization procedure registration instruction (SB000D) is on.

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Description of problem	Check item	Check procedure
Cannot turn on/off the remote output RY of a remote device station.	Is the corresponding remote device station performing data link?	• Check the LED displays on the corresponding remote device station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data read from the correct address of remote output RY (buffer memory)?	Check the user program.
	Is the correct master station's parameter information area (CPU internal parameters, default parameters) being used?	Check the parameter information (SW0067).
	Is the corresponding remote device station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
	Is the remote device station initialization procedure registration being executed?	Check if the remote device station initialization procedure registration instruction (SB000D) is on.
Data cannot be received by the remote register RWr of a remote device station.	Is the corresponding remote device station performing data link?	• Check the LED displays on the corresponding remote device station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data read from the correct address of the remote register RWr (buffer memory)?	Check the user program.
	Is the correct master station's parameter information area (CPU internal parameters, default parameters) being used?	Check the parameter information (SW0067).
	Is the corresponding remote device station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
	Is the remote device station initialization procedure registration being executed?	Check if the remote device station initialization procedure registration instruction (SB000D) is on.

Description of problem	Check item	Check procedure
Cannot write data to the remote register RWw of a remote device station.	Is the corresponding remote device station performing data link?	• Check the LED displays on the corresponding remote device station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data read from the correct address of the remote register RWw (buffer memory)?	Check the user program.
	Is the correct master station's parameter information area (CPU internal parameters, default parameters) being used?	Check the parameter information (SW0067).
	Is the corresponding remote device station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
	Is the remote device station initialization procedure registration being executed?	Check if the remote device station initialization procedure registration instruction (SB000D) is on.
Cannot communicate from the master station (remote output RY) to a local station (remote input RX).	Is the corresponding local station performing data link?	• Check the LED displays on the corresponding local station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data written to the correct address of the remote output RY (buffer memory) of the master station?	Check the user program.
	Is data read from the correct address of the remote input RX (buffer memory) of the local station?	Check the user program.
	Is the corresponding local station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).

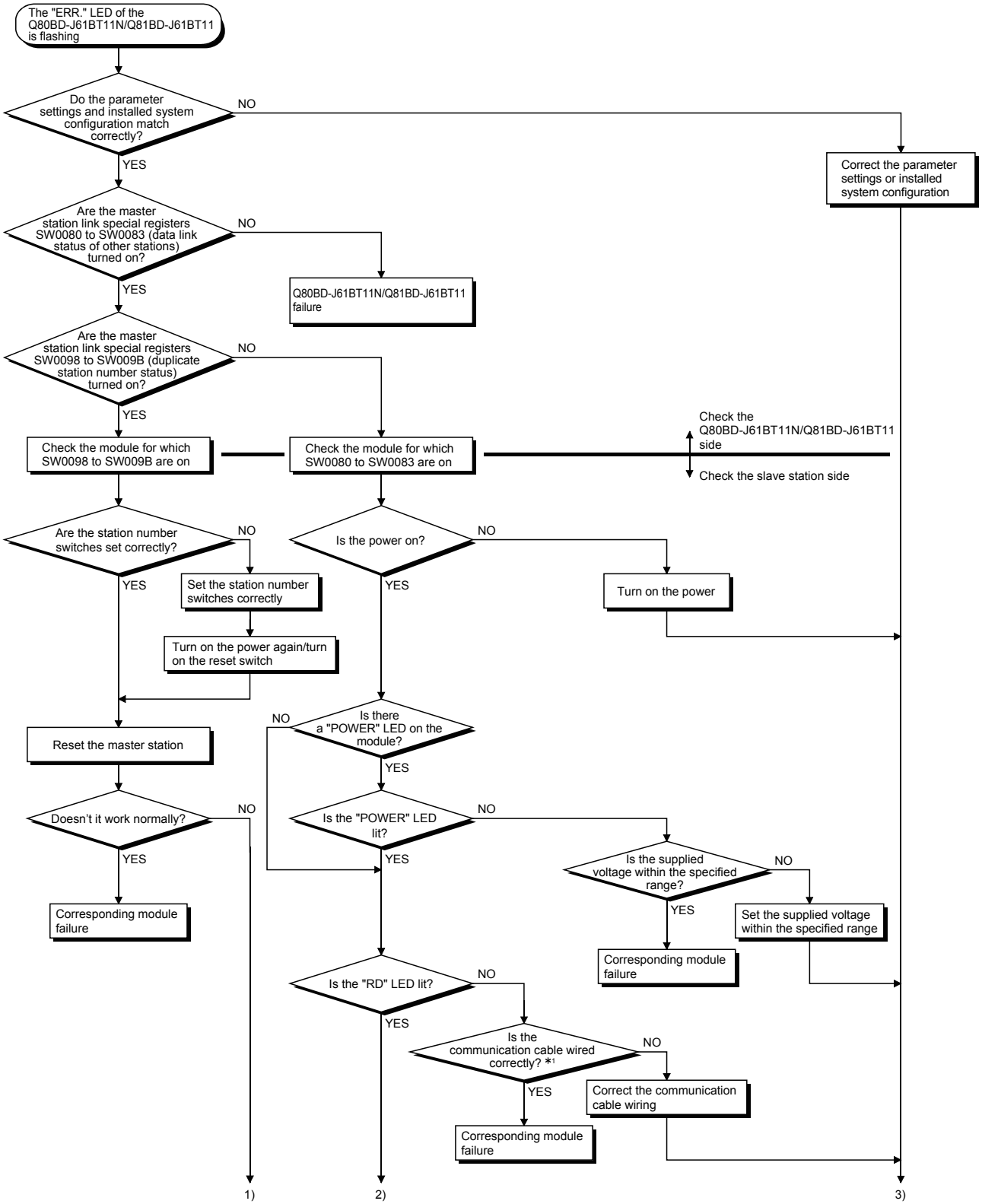
Description of problem	Check item	Check procedure
Cannot communicate from a local station (remote output RY) to the master station (remote input RX).	Is the corresponding local station performing data link?	• Check the LED displays on the corresponding local station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data written to the correct address of the remote output RY (buffer memory) of the local station?	Check the user program.
	Is data read from the correct address of the remote input RX (buffer memory) of the master station?	Check the user program.
	Is the corresponding local station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
Cannot communicate from the master station (remote register RWw) to a local station (remote register RWr).	Is the corresponding local station performing data link?	• Check the LED displays on the corresponding local station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Do the number of occupied stations set for the local station match the station information of the master station?	
	Is data written to the correct address of the remote register RWw (buffer memory) of the master station?	Check the user program.
	Is data read from the correct address of the remote register RWr (buffer memory) of the local station?	Check the user program.
	Is the corresponding local station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).

Description of problem	Check item	Check procedure
Cannot communicate from a local station (remote register RWw) to the master station (remote register RWr).	Is the corresponding local station performing data link?	• Check the LED displays on the corresponding local station. • Check the communication status of the master station with other stations (SW0080 to SW0083)
	Is data written to the correct address of the remote register RWw (buffer memory) of the local station?	Check the user program.
	Is data read from the correct address of the remote register RWr (buffer memory) of the master station?	Check the user program.
	Is the corresponding local station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
The local station does not operate with the specified number of occupied stations.	Is the QJ61BT11 of function version A or the A80BD-J61BT11 set to occupy 2 or 3 stations?	Set the number of occupied stations to 1 or 4.
Cannot stop data link.	Is the data link stop (SB0002) turned on?	Check the user program.
	Has an error occurred?	Check the data link stop result (SW0045).
Cannot restart data link.	Is the data link restart (SB0000) turned on?	Check the user program.
	Has an error occurred?	Check the data link restart result (SW0041).
	Is the corresponding station disconnected?	• Check the cable connection visually or with a line test. • Check the parameters (for local station). • Check the operation status of the programmable controller CPU in the corresponding station.
The remote station/local station/intelligent device station/standby master station does not start up.	Do the parameters for the number of modules and station information match the settings of the modules that do not start up?	Check the parameters.
	Are there any duplicate station numbers?	Check the station number setting.
The local station or standby master station does not start up and the "ERR." LED turns on.	Is 65 or larger station No. set to the local station (including the number of occupied stations)?	Check the station No. setting and parameters of the local station or standby master station.
	Does the mode of the master station match that of the local station or standby master station?	Check the parameters of the master station and local station or standby master station.
	Has the parameter of the master station that will return to the system by the standby master function been rewritten?	Check the parameters of the master station.
Faulty stations cannot be detected.	Is the station set as an error invalid station?	Check the parameters.
	Are there any duplicate station numbers?	Check the station number setting.
Faulty stations are generated depending on the transmission rate.	Can the faulty station be identified using the communication status of other stations (SW0080 to SW0083)?	• Check the switch settings for the faulty station. • Check that the cable is properly wired. • Check that the shield of the cable is grounded. • Connect the terminal resistors that match the cable type used to the terminal stations at both ends of the CC-Link system.
	Can communication be performed normally if the transmission rate is reduced to a lower speed such as 156 kbps?	

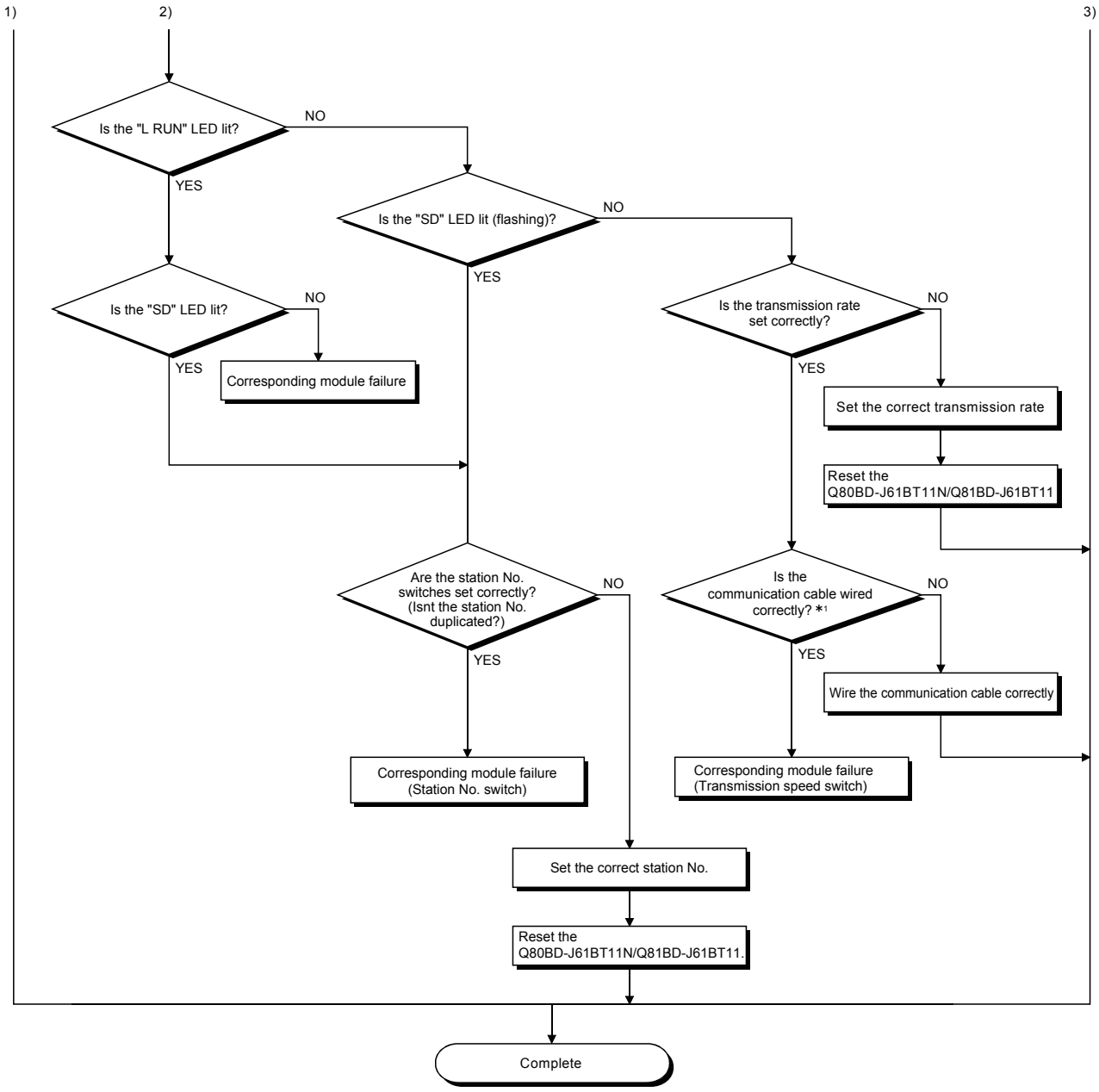
Description of problem	Check item	Check procedure
The remote device station is not operating normally.	Are there any errors in the initial settings of the remote device station?	• Check the parameters. • Check the user program.
When multiple remote stations are powered off at the same time at 156 kbps, the "L RUN" LED goes off temporarily.	What is the setting for the number of retries?	• Increase the transmission rate. • Reduce the number of retries.
The A80BD-J61BT11 set to the local station does not operate.	Is the CC-Link Ver.2 compatible A80BD-J61BT11 (ROM version “R” or later) used for the network where the master station is in the remote net Ver.2 mode or remote net additional mode?	• Check the mode of the master station. • Check the ROM version of the A80BD-J61BT11.
The A80BD-J61BT13 does not operate.	Is the CC-Link Ver.2 compatible A80BD-J61BT13 (ROM version “Q” or later) used for the network where the master station is in the remote net Ver.2 mode or remote net additional mode?	• Check the mode of the master station. • Check the ROM version of the A80BD-J61BT13.

16.5.2 Troubleshooting flow when the "ERR." LED on the master station is flashing

(1) When the CC-Link Ver.2 board is used as the master board


The "ERR." LED of the Q80BD-J61BT11N/Q81BD-J61BT11 is flashing
Do the parameter settings and installed system configuration match correctly?
NO
YES
Correct the parameter settings or installed system configuration
Are the master station link special registers SW0080 to SW0083 (data link status of other stations) turned on?
NO
YES
Q80BD-J61BT11N/Q81BD-J61BT11 failure
Are the master station link special registers SW0098 to SW009B (duplicate station number status) turned on?
NO
YES
Check the module for which SW0098 to SW009B are on
Check the module for which SW0080 to SW0083 are on
Check the Q80BD-J61BT11N/Q81BD-J61BT11 side
Check the slave station side
Are the station number switches set correctly?
NO
YES
Set the station number switches correctly
Turn on the power again/turn on the reset switch
Is the power on?
NO
YES
Turn on the power
Reset the master station
Doesn't it work normally?
NO
YES
Corresponding module failure
Is there a "POWER" LED on the module?
NO
YES
Is the "POWER" LED lit?
NO
YES
Is the supplied voltage within the specified range?
NO
YES
Set the supplied voltage within the specified range
Corresponding module failure
Is the "RD" LED lit?
NO
YES
Is the communication cable wired correctly? *1
NO
YES
Correct the communication cable wiring
Corresponding module failure
1)
2)
3)

*1: Check for short circuits, reversed connections, disconnections, terminal resistors, FG connections, overall distance, and distance between stations.



*1: Check for short circuits, reversed connections, disconnections, terminal resistors, FG connections, overall distance, and distance between stations.

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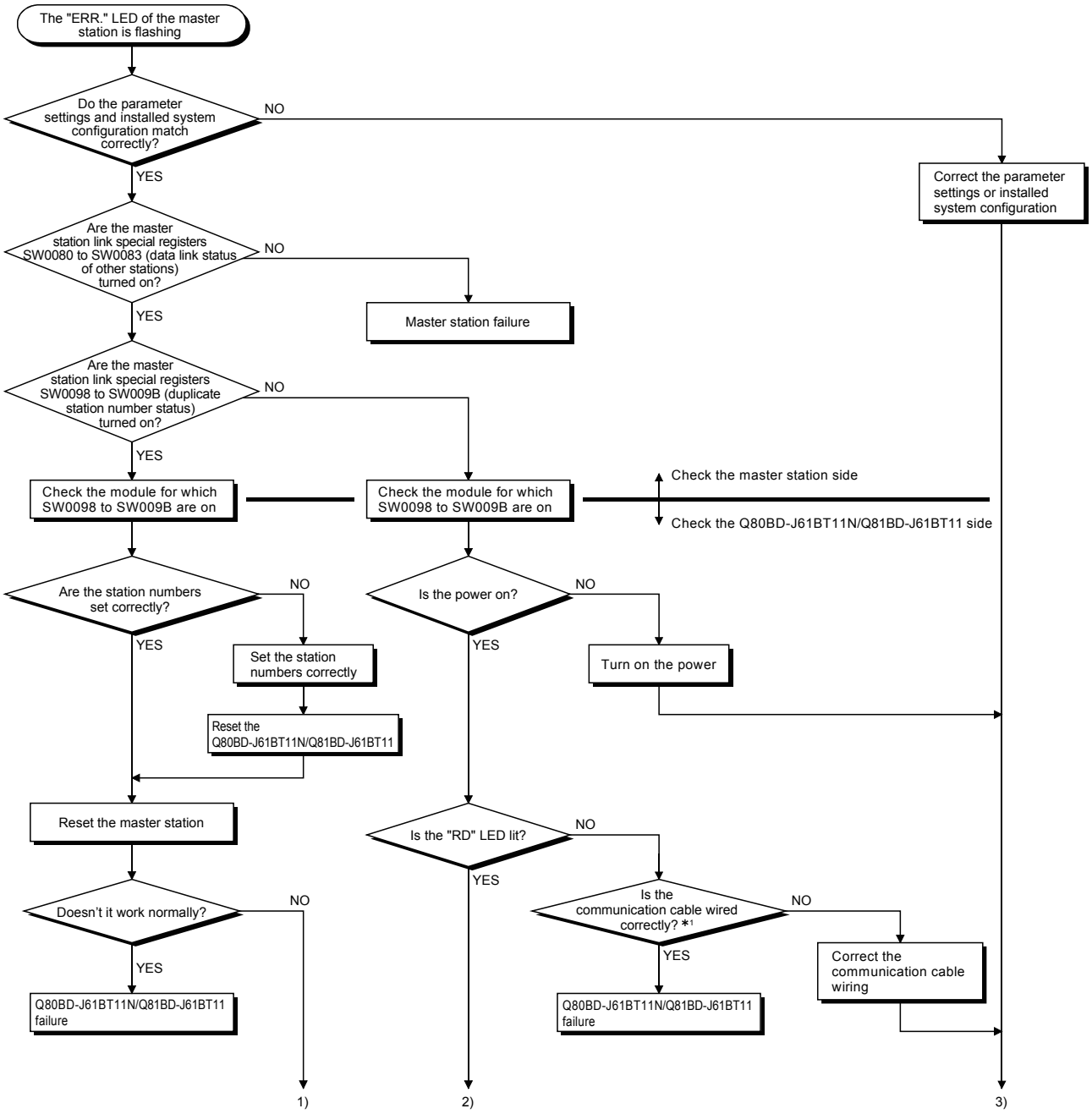
(2) When the CC-Link Ver.2 board is used as a local board


The "ERR." LED of the master station is flashing
Do the parameter settings and installed system configuration match correctly?
NO
YES
Correct the parameter settings or installed system configuration
Are the master station link special registers SW0080 to SW0083 (data link status of other stations) turned on?
NO
YES
Master station failure
Are the master station link special registers SW0098 to SW009B (duplicate station number status) turned on?
NO
YES
Check the module for which SW0098 to SW009B are on
Check the module for which SW0098 to SW009B are on
Check the master station side
Check the Q80BD-J61BT11N/Q81BD-J61BT11 side
Are the station numbers set correctly?
NO
YES
Set the station numbers correctly
Reset the Q80BD-J61BT11N/Q81BD-J61BT11
Is the power on?
NO
YES
Turn on the power
Reset the master station
Doesn't it work normally?
NO
YES
Q80BD-J61BT11N/Q81BD-J61BT11 failure
Is the "RD" LED lit?
NO
YES
Is the communication cable wired correctly? *1
NO
YES
Correct the communication cable wiring
Q80BD-J61BT11N/Q81BD-J61BT11 failure
1)
2)
3)

*1: Check for short circuits, reversed connections, disconnections, terminal resistors, FG connections, overall distance, and distance between stations.

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*1: Check for short circuits, reversed connections, disconnections, terminal resistors, FG connections, overall distance, and distance between stations.

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16.6 Measures for Slow Personal Computer Operation

This section explains the probable causes and corrective measures when the operation of a personal computer becomes slow.

(1) Probable causes

The load due to the link refresh function may be the cause.
When the block data assurance per station setting is enabled, the CC-Link Ver.2 board driver executes the link refresh between CC-Link Ver.2 board driver buffer and CC-Link Ver.2 board link device based on the cycle set in the parameter setting ("Other settings" screen) of the CC-Link Ver.2 utility.
At this time, if the following causes are overlapped, the processing time of the link refresh among the total processing capacity of the personal computer increases and the operation of the personal computer becomes slow.

- The link refresh cycle is short.
- There are many remote station points of the whole network.
- The processing capacity of a personal computer is low.

(2) Corrective measures

The following shows the measures when the operation of a personal computer becomes slow.

- Extend the link refresh cycle at <<Parameter settings>>(“Other settings” screen) in the CC-Link Ver.2 utility.
- Disable the block data assurance per station
- Decrease the remote station points on the master station’s parameter settings
- Decrease the number of boards to be installed on the personal computer
- Increase the processing capacity of the personal computer

If any of the above corrective actions do not help, refer to Section 16.7.

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16.7 Information Required for Inquiries

When the troubleshooting cannot solve the problem, or a board failure occurs, please consult your local Mitsubishi service center or representative.
Inform the following conditions and situations when inquiring the problems.

(1) Product information

(a) Product version

Inform the model name and version of the board and utility.

(b) Personal computer

Inform the following descriptions.

- Name of the personal computer (manufacturer)
- CPU
- Memory size
- Operating system

(c) Other option board

Inform the following descriptions.

- Existence (If exist, type, the number of boards and so on)
- Situation checked with disconnecting other option boards

(2) Failure content

(a) Failure description (details)

Example) The LINK LED does not turn on even though the computer is turned on.

(b) Occurrence frequency

(c) Occurrence condition

If the failure occurs only in the specific case, inform the occurrence condition noticed.

(c) Troubleshooting result

Inform the following descriptions.

- The result of troubleshooting performed
- The situation when checking with other boards or computers

Example) Event ID 295 "The Board WDT error had occurred." error is displayed on the event viewer when the personal computer is started. It also occurs when mounting the problem board with another computer. Other boards mounted with the computer works properly.

MEMO

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APPENDIX

Appendix 1 Buffer memory details

The following describes the details of the items shown in the buffer memory list in Section 3.4.

(1) Remote input (RX) and remote output (RY)

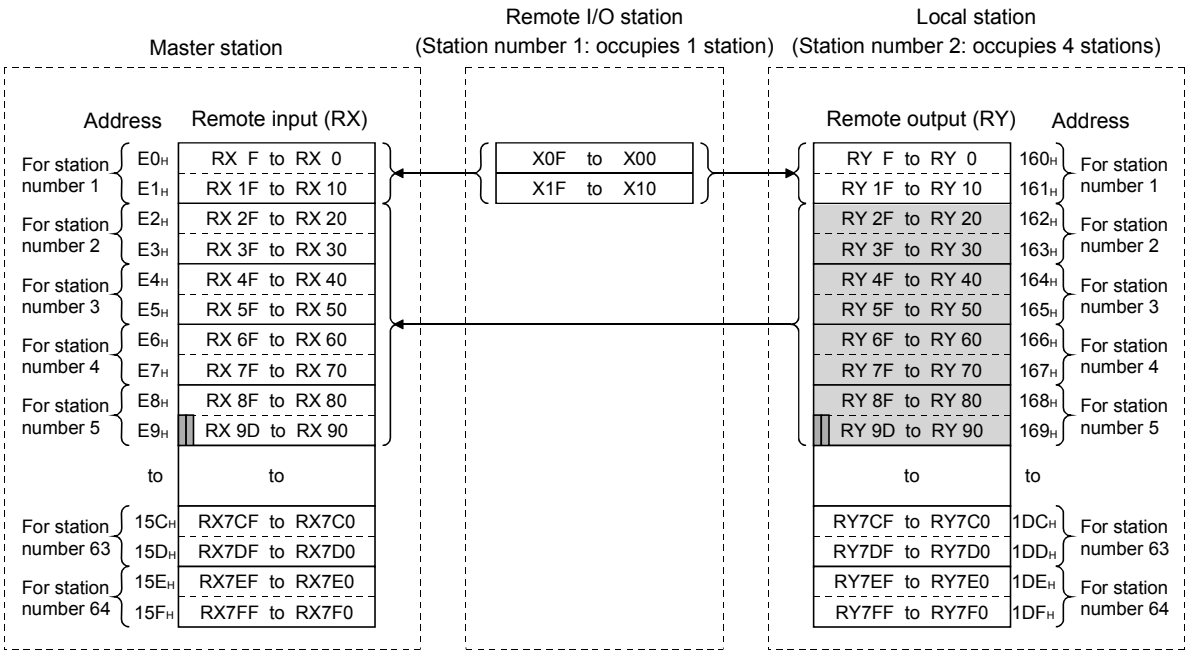
When the remote net ver.1 mode or remote net additional mode is selected, the number of points indicated below is used.

(a) Master station ← remote I/O station/remote device station/local station

1) Master station
- The input status from the remote I/O station, remote device station (RX) and local station (RY) is stored.
- Two words (32 points) are used per station.

2) Local station
- Data to be sent to the master station is stored in the remote output (RY) of the address corresponding to the host station number.
- The input status from the remote I/O station, remote device station (RX) and other local station is stored.
- Two words (32 points) are used per station.

▯ … The last two bits cannot be used for communication between the master station and the local station.
(In the example below, RY9E and RY9F cannot be used.)



APP

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The following tables show the station numbers and corresponding buffer-memory addresses.

[Master station]

Table of station numbers and corresponding buffer memory addresses

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	E0H to E1H	14	FAH to FBH	27	114H to 115H	40	12EH to 12FH	53	148H to 149H
2	E2H to E3H	15	FCH to FDH	28	116H to 117H	41	130H to 131H	54	14AH to 14BH
3	E4H to E5H	16	FEH to FFH	29	118H to 119H	42	132H to 133H	55	14CH to 14DH
4	E6H to E7H	17	100H to 101H	30	11AH to 11BH	43	134H to 135H	56	14EH to 14FH
5	E8H to E9H	18	102H to 103H	31	11CH to 11DH	44	136H to 137H	57	150H to 151H
6	EAH to EBH	19	104H to 105H	32	11EH to 11FH	45	138H to 139H	58	152H to 153H
7	ECH to EDH	20	106H to 107H	33	120H to 121H	46	13AH to 13BH	59	154H to 155H
8	EEH to EFH	21	108H to 109H	34	122H to 123H	47	13CH to 13DH	60	156H to 157H
9	F0H to F1H	22	10AH to 10BH	35	124H to 125H	48	13EH to 13FH	61	158H to 159H
10	F2H to F3H	23	10CH to 10DH	36	126H to 127H	49	140H to 141H	62	15AH to 15BH
11	F4H to F5H	24	10EH to10FH	37	128H to 129H	50	142H to 143H	63	15CH to 15DH
12	F6H to F7H	25	110H to 111H	38	12AH to 12BH	51	144H to 145H	64	15EH to 15FH
13	F8H to F9H	26	112H to 113H	39	12CH to 12DH	52	146H to 147H	—	—

[Local station]

Table of station numbers and corresponding buffer memory addresses

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	160H to 161H	14	17AH to 17BH	27	194H to 195H	40	1AEH to 1AFH	53	1C8H to 1C9H
2	162H to 163H	15	17CH to 17DH	28	196H to 197H	41	1B0H to 1B1H	54	1CAH to 1CBH
3	164H to 165H	16	17EH to 17FH	29	198H to 199H	42	1B2H to 1B3H	55	1CCH to 1CDH
4	166H to 167H	17	180H to 181H	30	19AH to 19BH	43	1B4H to 1B5H	56	1CEH to 1CFH
5	168H to 169H	18	182H to 183H	31	19CH to 19DH	44	1B6H to 1B7H	57	1D0H to 1D1H
6	16AH to 16BH	19	184H to 185H	32	19EH to 19FH	45	1B8H to 1B9H	58	1D2H to 1D3H
7	16CH to 16DH	20	186H to 187H	33	1A0H to 1A1H	46	1BAH to 1BBH	59	1D4H to 1D5H
8	16EH to 16FH	21	188H to 189H	34	1A2H to 1A3H	47	1BCH to 1BDH	60	1D6H to 1D7H
9	170H to 171H	22	18AH to 18BH	35	1A4H to 1A5H	48	1BEH to 1BFH	61	1D8H to 1D9H
10	172H to 173H	23	18CH to 18DH	36	1A6H to 1A7H	49	1C0H to 1C1H	62	1DAH to 1DBH
11	174H to 175H	24	18EH to 18FH	37	1A8H to 1A9H	50	1C2H to 1C3H	63	1DCH to 1DDH
12	176H to 177H	25	190H to 191H	38	1AAH to 1ABH	51	1C4H to 1C5H	64	1DEH to 1DFH
13	178H to 179H	26	192H to 193H	39	1ACH to 1ADH	52	1C6H to 1C7H	—	—

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(b) Master station → remote I/O station/remote device station/local station

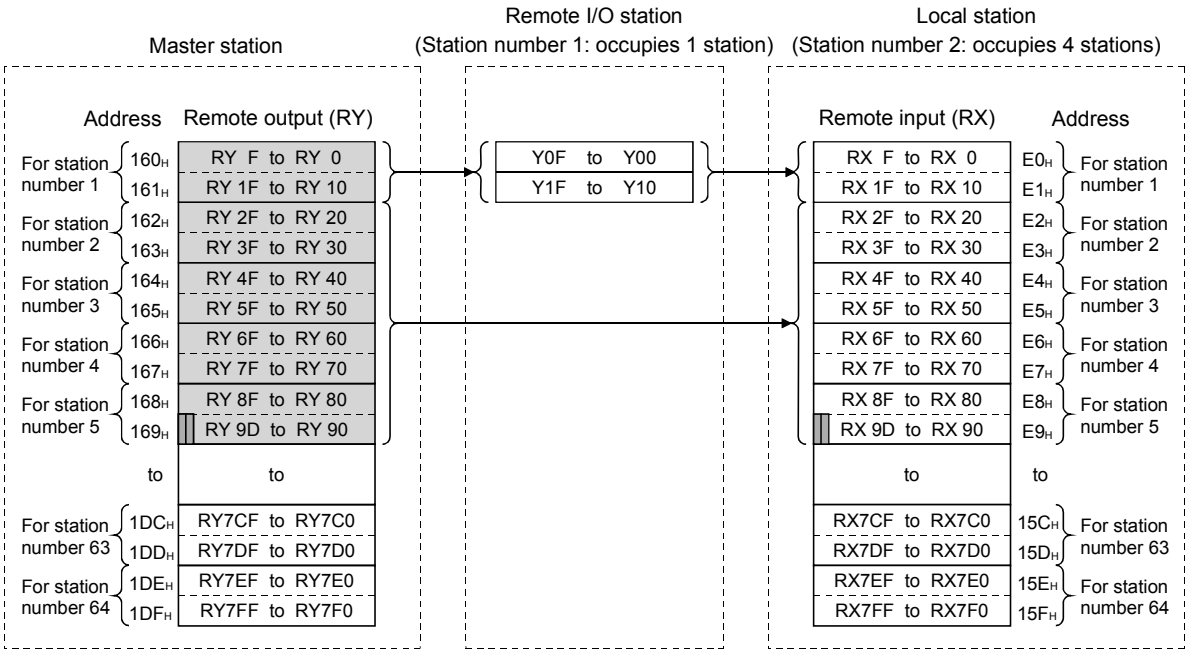
1) Master station

- The output status to the remote I/O station, remote device station (RY) and all local stations (RX) is stored.
- Two words (32points) are used per station.

2) Local station

- The data received from the remote I/O station, remote device station (RY) and master station (RY) is stored.
- Two words (32points) are used per station.

▯ … The last two bits cannot be used for communication between the master station and the local station.
(In the example below, RY9E and RY9F cannot be used.)



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The following tables show the station numbers and corresponding buffer memory addresses.

[Master station]

Table of station numbers and corresponding buffer memory addresses

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	160H to 161H	14	17AH to 17BH	27	194H to 195H	40	1AEH to 1AFH	53	1C8H to 1C9H
2	162H to 163H	15	17CH to 17DH	28	196H to 197H	41	1B0H to 1B1H	54	1CAH to 1CBH
3	164H to 165H	16	17EH to 17FH	29	198H to 199H	42	1B2H to 1B3H	55	1CCH to 1CDH
4	166H to 167H	17	180H to 181H	30	19AH to 19BH	43	1B4H to 1B5H	56	1CEH to 1CFH
5	168H to 169H	18	182H to 183H	31	19CH to 19DH	44	1B6H to 1B7H	57	1D0H to 1D1H
6	16AH to 16BH	19	184H to 185H	32	19EH to 19FH	45	1B8H to 1B9H	58	1D2H to 1D3H
7	16CH to 16DH	20	186H to 187H	33	1A0H to 1A1H	46	1BAH to 1BBH	59	1D4H to 1D5H
8	16EH to 16FH	21	188H to 189H	34	1A2H to 1A3H	47	1BCH to 1BDH	60	1D6H to 1D7H
9	170H to 171H	22	18AH to 18BH	35	1A4H to 1A5H	48	1BEH to 1BFH	61	1D8H to 1D9H
10	172H to 173H	23	18CH to 18DH	36	1A6H to 1A7H	49	1C0H to 1C1H	62	1DAH to 1DBH
11	174H to 175H	24	18EH to 18FH	37	1A8H to 1A9H	50	1C2H to 1C3H	63	1DCH to 1DDH
12	176H to 177H	25	190H to 191H	38	1AAH to 1ABH	51	1C4H to 1C5H	64	1DEH to 1DFH
13	178H to 179H	26	192H to 193H	39	1ACH to 1ADH	52	1C6H to 1C7H	—	—

[Local station]

Table of station numbers and corresponding buffer memory addresses

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	E0H to E1H	14	FAH to FBH	27	114H to 115H	40	12EH to 12FH	53	148H to 149H
2	E2H to E3H	15	FCH to FDH	28	116H to 117H	41	130H to 131H	54	14AH to 14BH
3	E4H to E5H	16	FEH to FFH	29	118H to 119H	42	132H to 133H	55	14CH to 14DH
4	E6H to E7H	17	100H to 101H	30	11AH to 11BH	43	134H to 135H	56	14EH to 14FH
5	E8H to E9H	18	102H to 103H	31	11CH to 11DH	44	136H to 137H	57	150H to 151H
6	EAH to EBH	19	104H to 105H	32	11EH to 11FH	45	138H to 139H	58	152H to 153H
7	ECH to EDH	20	106H to 107H	33	120H to 121H	46	13AH to 13BH	59	154H to 155H
8	EEH to EFH	21	108H to 109H	34	122H to 123H	47	13CH to 13DH	60	156H to 157H
9	F0H to F1H	22	10AH to 10BH	35	124H to 125H	48	13EH to 13FH	61	158H to 159H
10	F2H to F3H	23	10CH to 10DH	36	126H to 127H	49	140H to 141H	62	15AH to 15BH
11	F4H to F5H	24	10EH to10FH	37	128H to 129H	50	142H to 143H	63	15CH to 15DH
12	F6H to F7H	25	110H to 111H	38	12AH to 12BH	51	144H to 145H	64	15EH to 15FH
13	F8H to F9H	26	112H to 113H	39	12CH to 12DH	52	146H to 147H	—	—

(2) Remote registers (RWw) and (RWr)

When the remote net ver.1 mode or remote net additional mode is selected, the number of words indicated below is used.

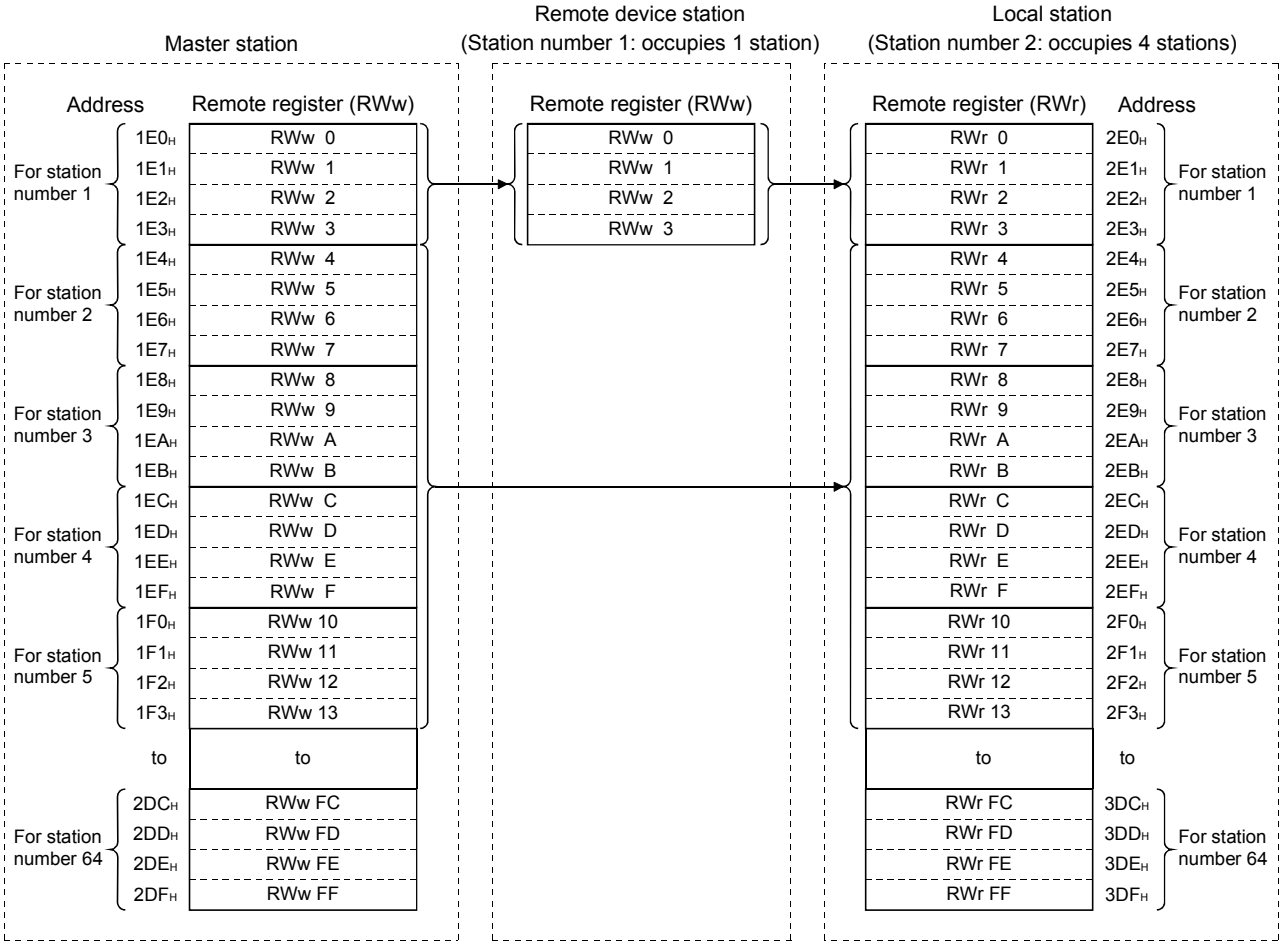
(a) Master station (RWw) → remote device station (RWw)/local station (RWr)

1) Master station

- The data to be sent to the remote register (RWw) of the remote device station and the remote registers (RWr) of all local stations are stored.
- Four words are used per station.

2) Local station

- The data sent to the remote register (RWw) of the remote device station can also be received.
- Four words are used per station.



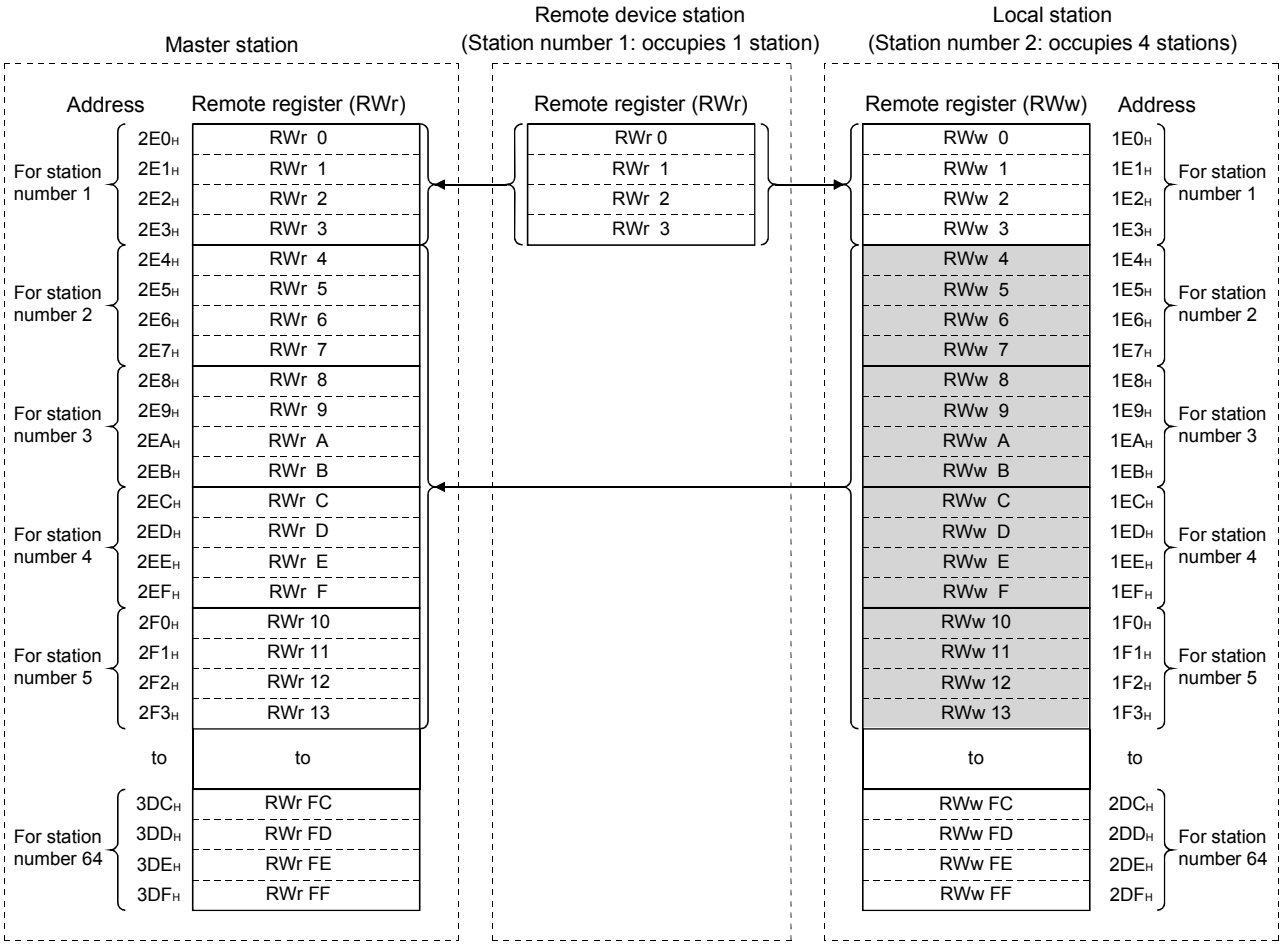
(b) Master station (RWr) ← remote device station (RWr)/local station (RWw)

1) Master station

- The send data from the remote register (RWr) of the remote device station and the remote register (RWw) of the local station is stored.
- Four words are used per station.

2) Local station

- Data is sent to the master station and other local stations by storing it in the address corresponding to the host station number.
- Data in the remote register (RWr) of the remote device station can also be received.
- Four words are used per station.



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The following tables show the station numbers and corresponding buffer memory addresses.

[Master station]

Table of station numbers and corresponding buffer memory addresses

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	2E0H to 2E3H	14	314H to 317H	27	348H to 34BH	40	37CH to 37FH	53	3B0H to 3B3H
2	2E4H to 2E7H	15	318H to 31BH	28	34CH to 34FH	41	380H to 383H	54	3B4H to 3B7H
3	2E8H to 2EBH	16	31CH to 31FH	29	350H to 353H	42	384H to 387H	55	3B8H to 3BBH
4	2ECH to 2EFH	17	320H to 323H	30	354H to 357H	43	388H to 38BH	56	3BCH to 3BFH
5	2F0H to 2F3H	18	324H to 327H	31	358H to 35BH	44	38CH to 38FH	57	3C0H to 3C3H
6	2F4H to 2F7H	19	328H to 32BH	32	35CH to 35FH	45	390H to 393H	58	3C4H to 3C7H
7	2F8H to 2FBH	20	32CH to 32FH	33	360H to 363H	46	394H to 397H	59	3C8H to 3CBH
8	2FCH to 2FFH	21	330H to 333H	34	364H to 367H	47	398H to 39BH	60	3CCH to 3CFH
9	300H to 303H	22	334H to 337H	35	368H to 36BH	48	39CH to 39FH	61	3D0H to 3D3H
10	304H to 307H	23	338H to 33BH	36	36CH to 36FH	49	3A0H to 3A3H	62	3D4H to 3D7H
11	308H to 30BH	24	33CH to 33FH	37	370H to 373H	50	3A4H to 3A7H	63	3D8H to 3DBH
12	30CH to 30FH	25	340H to 343H	38	374H to 377H	51	3A8H to 3ABH	64	3DCH to 3DFH
13	310H to 313H	26	344H to 347H	39	378H to 37BH	52	3ACH to 3AFH	—	—

[Local station]

Table of station numbers and corresponding buffer memory addresses

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	1E0H to 1E3H	14	214H to 217H	27	248H to 24BH	40	27CH to 27FH	53	2B0H to 2B3H
2	1E4H to 1E7H	15	218H to 21BH	28	24CH to 24FH	41	280H to 283H	54	2B4H to 2B7H
3	1E8H to 1EBH	16	21CH to 21FH	29	250H to 253H	42	284H to 287H	55	2B8H to 2BBH
4	1ECH to 1EFH	17	220H to 223H	30	254H to 257H	43	288H to 28BH	56	2BCH to 2BFH
5	1F0H to 1F3H	18	224H to 227H	31	258H to 25BH	44	28CH to 28FH	57	2C0H to 2C3H
6	1F4H to 1F7H	19	228H to 22BH	32	25CH to 25FH	45	290H to 293H	58	2C4H to 2C7H
7	1F8H to 1FBH	20	22CH to 22FH	33	260H to 263H	46	294H to 297H	59	2C8H to 2CBH
8	1FCH to 1FFH	21	230H to 233H	34	264H to 267H	47	298H to 29BH	60	2CCH to 2CFH
9	200H to 203H	22	234H to 237H	35	268H to 26BH	48	29CH to 29FH	61	2D0H to 2D3H
10	204H to 207H	23	238H to 23BH	36	26CH to 26FH	49	2A0H to 2A3H	62	2D4H to 2D7H
11	208H to 20BH	24	23CH to 23FH	37	270H to 273H	50	2A4H to 2A7H	63	2D8H to 2DBH
12	20CH to 20FH	25	240H to 243H	38	274H to 277H	51	2A8H to 2ABH	64	2DCH to 2DFH
13	210H to 213H	26	244H to 247H	39	278H to 27BH	52	2ACH to 2AFH	—	—

(3) Link special relays (SB)

The link special relays store the data link status using bit ON/OFF data.
Buffer memory addresses 5E0H to 5FFH correspond to link special relays SB0000 to SB01FF.
For details on the link special relays (SB0000 to SB01FF), refer to Appendix 2.1.
The following table shows the relationship between buffer memory addresses 5E0H to 5FFH and link special relays SB0000 to SB01FF.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
5E0H	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
5E1H	1F	1E	1D	1C	1B	1A	19	18	17	16	15	14	13	12	11	10
5E2H	2F	2E	2D	2C	2B	2A	29	28	27	26	25	24	23	22	21	20
5E3H	3F	3E	3D	3C	3B	3A	39	38	37	36	35	34	33	32	31	30
5E4H	4F	4E	4D	4C	4B	4A	49	48	47	46	45	44	43	42	41	40
5E5H	5F	5E	5D	5C	5B	5A	59	58	57	56	55	54	53	52	51	50
5E6H	6F	6E	6D	6C	6B	6A	69	68	67	66	65	64	63	62	61	60
5E7H	7F	7E	7D	7C	7B	7A	79	78	77	76	75	74	73	72	71	70
5E8H	8F	8E	8D	8C	8B	8A	89	88	87	86	85	84	83	82	81	80
5E9H	9F	9E	9D	9C	9B	9A	99	98	97	96	95	94	93	92	91	90
5EAH	AF	AE	AD	AC	AB	AA	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0
5EBH	BF	BE	BD	BC	BB	BA	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
5ECH	CF	CE	CD	CC	CB	CA	C9	C8	C7	C6	C5	C4	C3	C2	C1	C0
5EDH	DF	DE	DD	DC	DB	DA	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
5EEH	EF	EE	ED	EC	EB	EA	E9	E8	E7	E6	E5	E4	E3	E2	E1	E0
5EFH	FF	FE	FD	FC	FB	FA	F9	F8	F7	F6	F5	F4	F3	F2	F1	F0
5F0H	10F	10E	10D	10C	10B	10A	109	108	107	106	105	104	103	102	101	100
5F1H	11F	11E	11D	11C	11B	11A	119	118	117	116	115	114	113	112	111	110
5F2H	12F	12E	12D	12C	12B	12A	129	128	127	126	125	124	123	122	121	120
5F3H	13F	13E	13D	13C	13B	13A	139	138	137	136	135	134	133	132	131	130
5F4H	14F	14E	14D	14C	14B	14A	149	148	147	146	145	144	143	142	141	140
5F5H	15F	15E	15D	15C	15B	15A	159	158	157	156	155	154	153	152	151	150
5F6H	16F	16E	16D	16C	16B	16A	169	168	167	166	165	164	163	162	161	160
5F7H	17F	17E	17D	17C	17B	17A	179	178	177	176	175	174	173	172	171	170
5F8H	18F	18E	18D	18C	18B	18A	189	188	187	186	185	184	183	182	181	180
5F9H	19F	19E	19D	19C	19B	19A	199	198	197	196	195	194	193	192	191	190
5FAH	1AF	1AE	1AD	1AC	1AB	1AA	1A9	1A8	1A7	1A6	1A5	1A4	1A3	1A2	1A1	1A0
5FBH	1BF	1BE	1BD	1BC	1BB	1BA	1B9	1B8	1B7	1B6	1B5	1B4	1B3	1B2	1B1	1B0
5FCH	1CF	1CE	1CD	1CC	1CB	1CA	1C9	1C8	1C7	1C6	1C5	1C4	1C3	1C2	1C1	1C0
5FDH	1DF	1DE	1DD	1DC	1DB	1DA	1D9	1D8	1D7	1D6	1D5	1D4	1D3	1D2	1D1	1D0
5FEH	1EF	1EE	1ED	1EC	1EB	1EA	1E9	1E8	1E7	1E6	1E5	1E4	1E3	1E2	1E1	1E0
5FFH	1FF	1FE	1FD	1FC	1FB	1FA	1F9	1F8	1F7	1F6	1F5	1F4	1F3	1F2	1F1	1F0

(4) Link special registers (SW)

The link special registers store the data link status using word data.
Buffer memory addresses 600H to 7FFH correspond to link special registers SW0000 to SW01FF.
For more details on the link special registers (SW0000 to SW01FF), refer to Appendix 2.2.

(5) Slave station offset and size information

For the remote net ver.2 mode and the remote net additional mode, RX/RY/RWw/RWr assignment to station numbers varies depending on the expanded cyclic setting and the remote I/O station points setting.

(a) Offset

Head buffer memory addresses of RX/RY/RWw/RWr assigned to each station are stored.
When two or more stations are occupied, values are stored to the head buffer memory address of the station only. (When the station No. 1 occupies 2 stations, values are stored to RX/RY/RWw/RWr offset and size of station No. 1 only. RX/RY/RWw/RWr offset and size of station No. 2 are remained as default.)

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(b) Size

Sizes of RX/RY/RWw/RWr assigned to each station are stored in word data.

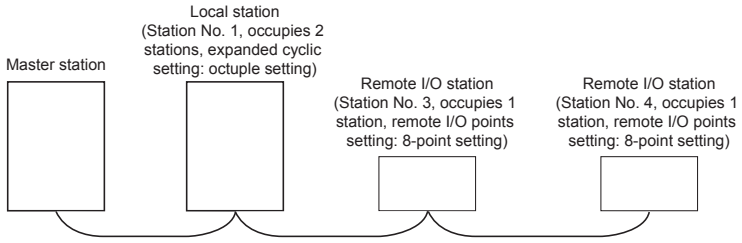
When a size is less than 1 word, it is rounded up and 1 is stored. (When 8-point setting is set for I/O station points setting, 1 is stored.)

For the I/O station points setting, refer to Section 4.4.6.

For a reserved station, 0000H is stored.

Buffer memory address		Item	Default (Hexadecimal)
Hexadecimal	Decimal		
3E0H	992	Station No. 1 RX offset	0000H
3E1H	993	Station No. 1 RX size	0000H
to	to	to	——
45EH	1118	Station No. 64 RX offset	0000H
45FH	1119	Station No. 64 RX size	0000H
460H	1120	Station No. 1 RY offset	0000H
461H	1121	Station No. 1 RY size	0000H
to	to	to	——
4DEH	1246	Station No. 64 RY offset	0000H
4DFH	1247	Station No. 64 RY size	0000H
4E0H	1248	Station No. 1 RWw offset	0000H
4E1H	1249	Station No. 1 RWw size	0000H
to	to	to	——
55EH	1374	Station No. 64 RWw offset	0000H
55FH	1375	Station No. 64 RWw size	0000H
560H	1376	Station No. 1 RWr offset	0000H
561H	1377	Station No. 1 RWr size	0000H
to	to	to	——
5DEH	1502	Station No. 64 RWr offset	0000H
5DFH	1503	Station No. 64 RWr size	0000H

(Example) When a local station with the expanded cyclic setting and a remote I/O station with the points setting are connected.


Master station
Local station
(Station No. 1, occupies 2 stations, expanded cyclic setting: octuple setting)
Remote I/O station
(Station No. 3, occupies 1 station, remote I/O points setting: 8-point setting)
Remote I/O station
(Station No. 4, occupies 1 station, remote I/O points setting: 8-point setting)

Buffer memory	Value	Description
Station No. 1 RX offset	4000H	Head buffer memory address of station No. 1 RX
Station No. 1 RX size	24 (18H)	384 (points of RX) / 16 = 24 words
Station No. 2 RX offset	4000H	Checks the station No. 1 area because it occupies 2 stations.
Station No. 2 RX size	0 (Default)	Checks the station No. 1 area because it occupies 2 stations.
Station No. 3 RX offset	4018H	Head buffer memory address of station No. 3 RX
Station No. 3 RX size	1 (1H)	The lower 8 bits of buffer memory address 4018H is the corresponding size for station No. 3 RX, however, because a value less than one word is rounded up, 1 is stored.
Station No. 4 RX offset	4018H	Head buffer memory address of station No. 4 RX
Station No. 4 RX size	1 (1H)	The higher 8 bits of buffer memory address 4018H is the corresponding size for station No. 4 RX, however, because a value less than one word is rounded up, 1 is stored.
Station No. 1 RY offset	4200H	Head buffer memory address of station No. 1 RY
Station No. 1 RY size	24 (18H)	384 (points of RY) / 16 = 24 words
Station No. 2 RY offset	4200H	Checks the station No. 1 area because it occupies 2 stations.
Station No. 2 RY size	0 (Default)	Checks the station No. 1 area because it occupies 2 stations.
Station No. 3 RY offset	4218H	Head buffer memory address of station No. 3 RY
Station No. 3 RY size	1 (1H)	The lower 8 bits of buffer memory address 4018H is the corresponding size for station No. 3 RY, however, because a value less than one word is rounded up, 1 is stored.
Station No. 4 RY offset	4218H	Head buffer memory address of station No. 4 RY
Station No. 4 RY size	1 (18H)	The higher 8 bits of buffer memory address 4018H is the corresponding size for station No. 4 RY, however, because a value less than one word is rounded up, 1 is stored.
Station No. 1 RWw offset	4400H	Head buffer memory address of station No. 1 RWw
Station No. 1 RWw size	64 (40H)	2 (number of occupied stations) x 32 (expanded cyclic setting) = 64
Station No. 2 RWw offset	4400H	Checks the station No. 1 area because it occupies 2 stations.
Station No. 2 RWw size	0 (Default)	Checks the station No. 1 area because it occupies 2 stations.
Station No. 3 RWw offset	4440H	Head buffer memory address of station No. 3 RWw
Station No. 3 RWw size	0 (Default)	Buffer memory size of station No. 3 RWw
Station No. 4 RWw offset	4440H	Head buffer memory address of station No. 4 RWw
Station No. 4 RWw size	0 (Default)	Buffer memory size of station No. 4 RWw
Station No. 1 RWr offset	4C00H	Head buffer memory address of station No. 1 RWr
Station No. 1 RWr size	64 (40H)	2 (number of occupied stations) x 32 (expanded cyclic setting) = 64
Station No. 2 RWr offset	4C00H	Checks the station No. 1 area because it occupies 2 stations.
Station No. 2 RWr size	0 (Default)	Checks the station No. 1 area because it occupies 2 stations.
Station No. 3 RWr offset	4C40H	Head buffer memory address of station No. 3 RWr
Station No. 3 RWr size	0 (Default)	Buffer memory size of station No. 3 RWr
Station No. 4 RWr offset	4C40H	Head buffer memory address of station No. 4 RWr
Station No. 4 RWr size	0 (Default)	Buffer memory size of station No. 4 RWr

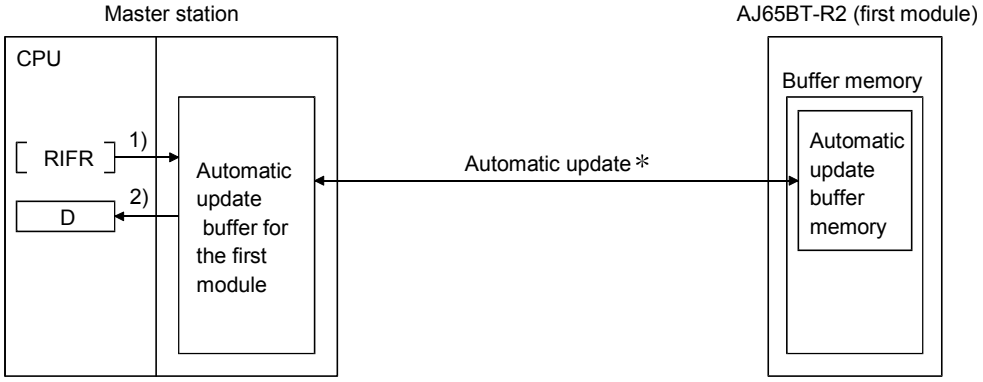
(6) Random access buffer

The random access buffer stores any data to be sent to other stations.
The reading and writing of data are performed using transient transmission.

(7) Automatic update buffer

The automatic update buffer stores automatic update data when performing transient transmission (communication using the automatic update buffer) with the AJ65BT-R2.
Set the automatic update buffer size for the AJ65BT-R2 in the Parameter settings of the CC-Link Ver.2 Utility.
For more details on the automatic update buffer size settings, refer to Section 6.1.

[Communication example using the automatic update buffer]



1) Data are written to the automatic update buffer of the 1st module.
2) The automatic update buffer data are transferred between the AJ65BT-R2 and CC-Link Ver.2 board by the link scan.
3) The data is read from the automatic update buffer for the 1st module.

*: For details on the automatic update timing, refer to AJ65BT-R2 Type RS-232C Interface Module User's Manual.

(8) Ver.2 compatible remote input (RX) and Ver.2 compatible remote output (RY)

When the remote net ver.2 mode or remote net additional mode is selected, the number of points indicated below is used.

(a) Master station ← remote I/O station/remote device station/local station

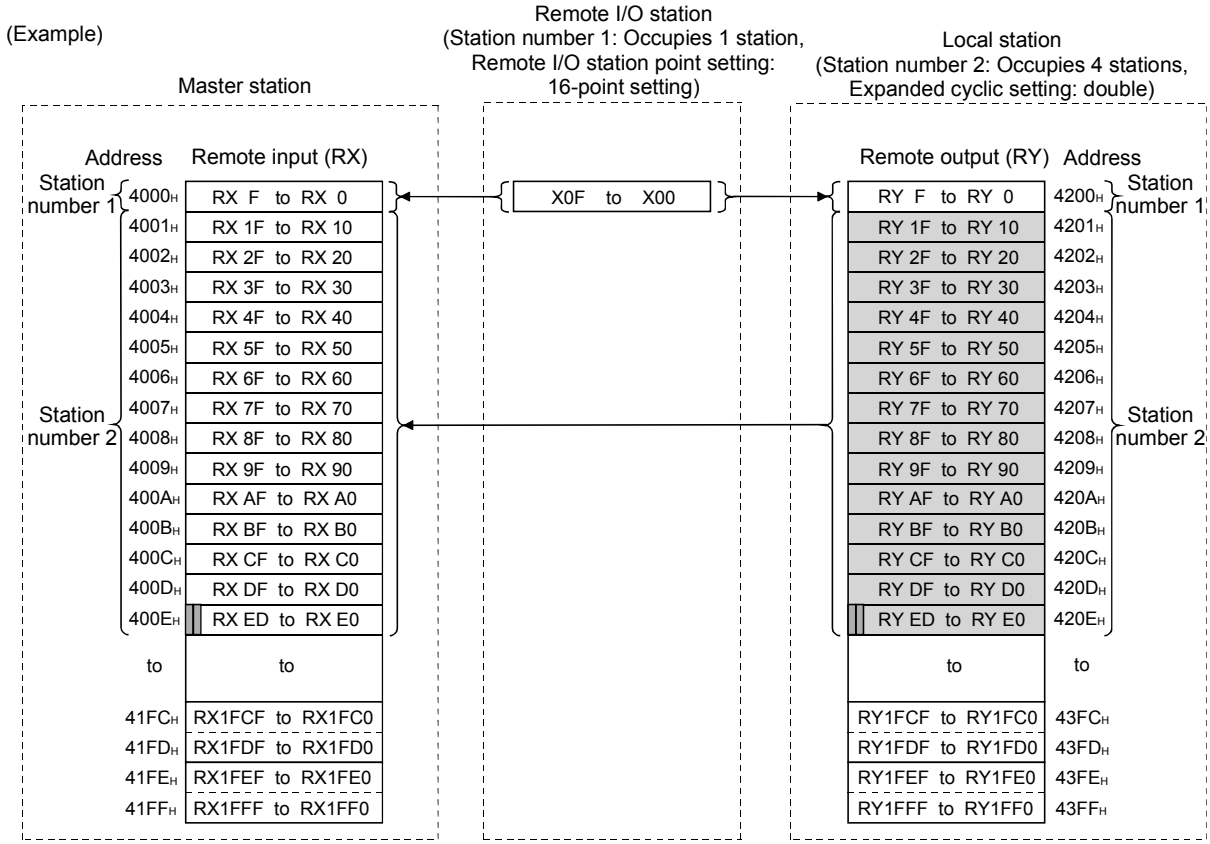
1) Master station

- The input status from the remote I/O station, remote device station (RX) and local station (RY) is stored.
- When 1 station is occupied, 2, 4 or 8 words (32, 64 or 128 points) are used. The number of used points changes depending on the expanded cyclic setting and the occupied station count. (refer to Section 3.2)

2) Local station

- Data to be sent to the master station is stored in the remote output (RY) of the address corresponding to the host station number.
- The input status from the remote I/O station, remote device station (RX) and other local station is stored.
- When 1 station is occupied, 2, 4 or 8 words (32, 64 or 128 points) are used. The number of used points changes depending on the expanded cyclic setting and the occupied station count. (refer to Section 3.2)

▯ … The last two bits cannot be used for communication between the master station and the local station.
(In the example below, RYEE and RYEF cannot be used.)


(Example)
Master station
Remote I/O station
(Station number 1: Occupies 1 station,
Remote I/O station point setting:
16-point setting)
Local station
(Station number 2: Occupies 4 stations,
Expanded cyclic setting: double)
Address
Remote input (RX)
Station number 1
4000H RX F to RX 0
4001H RX 1F to RX 10
4002H RX 2F to RX 20
4003H RX 3F to RX 30
4004H RX 4F to RX 40
4005H RX 5F to RX 50
4006H RX 6F to RX 60
4007H RX 7F to RX 70
Station number 2
4008H RX 8F to RX 80
4009H RX 9F to RX 90
400AH RX AF to RX A0
400BH RX BF to RX B0
400CH RX CF to RX C0
400DH RX DF to RX D0
400EH RX ED to RX E0
to to
41FCH RX1FCF to RX1FC0
41FDH RX1FDF to RX1FD0
41FEH RX1FEF to RX1FE0
41FFH RX1FFF to RX1FF0
X0F to X00
Remote output (RY)
Address
4200H RY F to RY 0
4201H RY 1F to RY 10
4202H RY 2F to RY 20
4203H RY 3F to RY 30
4204H RY 4F to RY 40
4205H RY 5F to RY 50
4206H RY 6F to RY 60
4207H RY 7F to RY 70
4208H RY 8F to RY 80
4209H RY 9F to RY 90
420AH RY AF to RY A0
420BH RY BF to RY B0
420CH RY CF to RY C0
420DH RY DF to RY D0
420EH RY ED to RY E0
to to
43FCH RY1FCF to RY1FC0
43FDH RY1FDF to RY1FD0
43FEH RY1FEF to RY1FE0
43FFH RY1FFF to RY1FF0
Station number 1
Station number 2

(b) Master station → remote I/O station/remote device station/local station

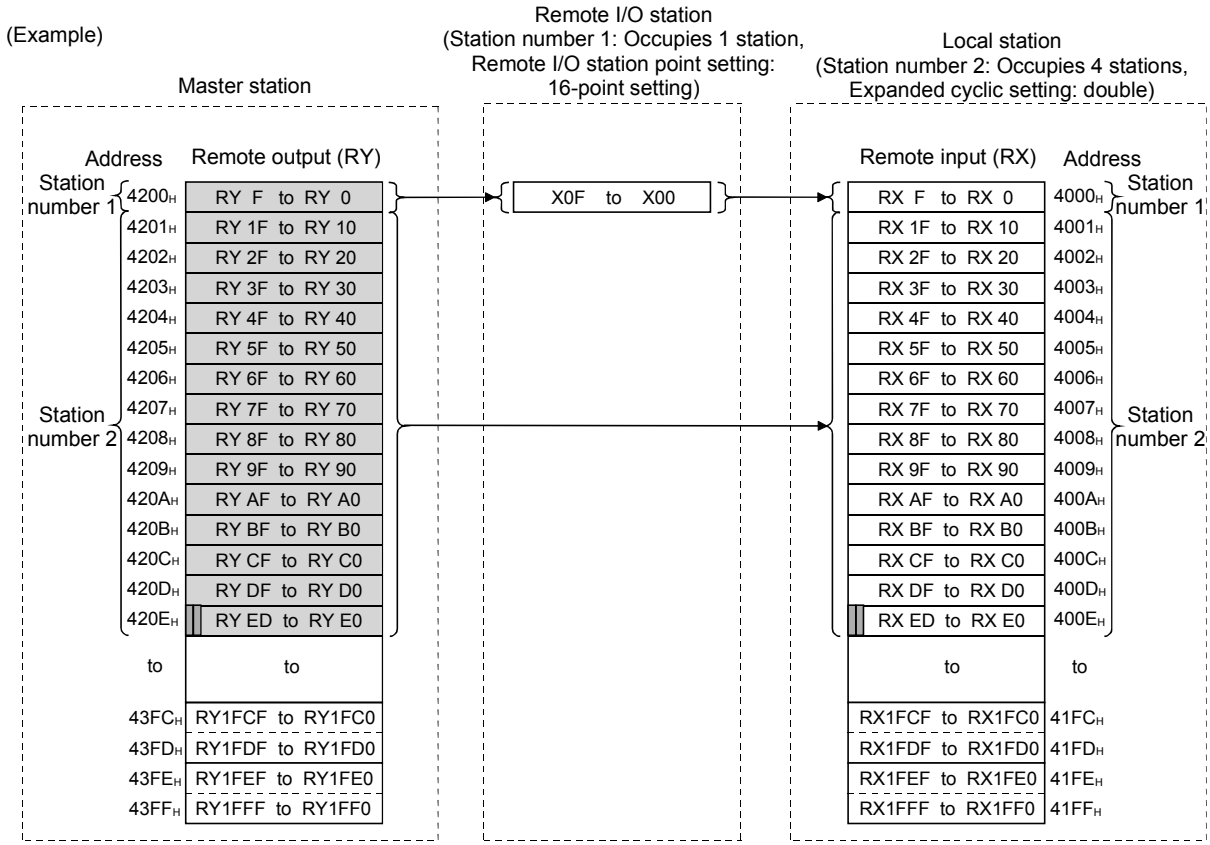
1) Master station

- The output status to the remote I/O station, remote device station (RY) and all local stations (RX) is stored.
- When 1 station is occupied, 2, 4 or 8 words (32, 64 or 128 points) are used. The number of used points changes depending on the expanded cyclic setting and the occupied station count. (refer to Section 3.2)

2) Local station

- The data received from the remote I/O station, remote device station (RY) and master station (RY) is stored.
- When 1 station is occupied, 2, 4 or 8 words (32, 64 or 128 points) are used. The number of used points changes depending on the expanded cyclic setting and the occupied station count. (refer to Section 3.2)

… The last two bits cannot be used for communication between the master station and the local station.
(In the example below, RYEE and RYEF cannot be used.)



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(9) Ver.2 compatible remote registers (RWw) and (RWr)

When the remote net ver.2 mode or remote net additional mode is selected, the number of words indicated below is used.

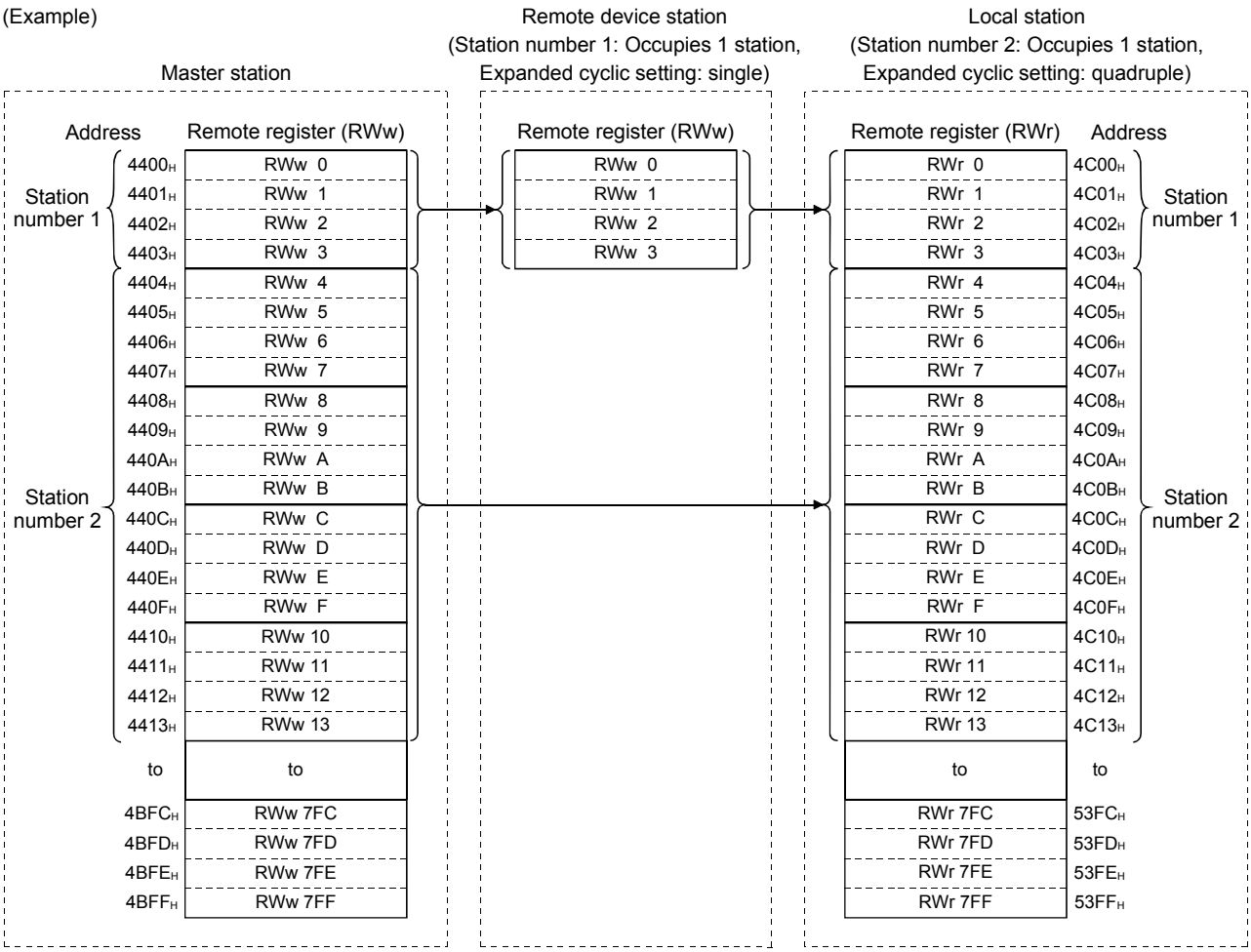
(a) Master station (RWw) → remote device station (RWw)/local station (RWr)

1) Master station

- The data to be sent to the remote register (RWw) of the remote device station and the remote registers (RWr) of all local stations are stored.
- When 1 station is occupied, any of 4 to 32 words are used. The number of used points changes depending on the expanded cyclic setting and the occupied station count. (refer to Section 3.2)

2) Local station

- The data sent to the remote register (RWw) of the remote device station can also be received.
- When 1 station is occupied, any of 4 to 32 words are used. The number of used points changes depending on the expanded cyclic setting and the occupied station count. (refer to Section 3.2)



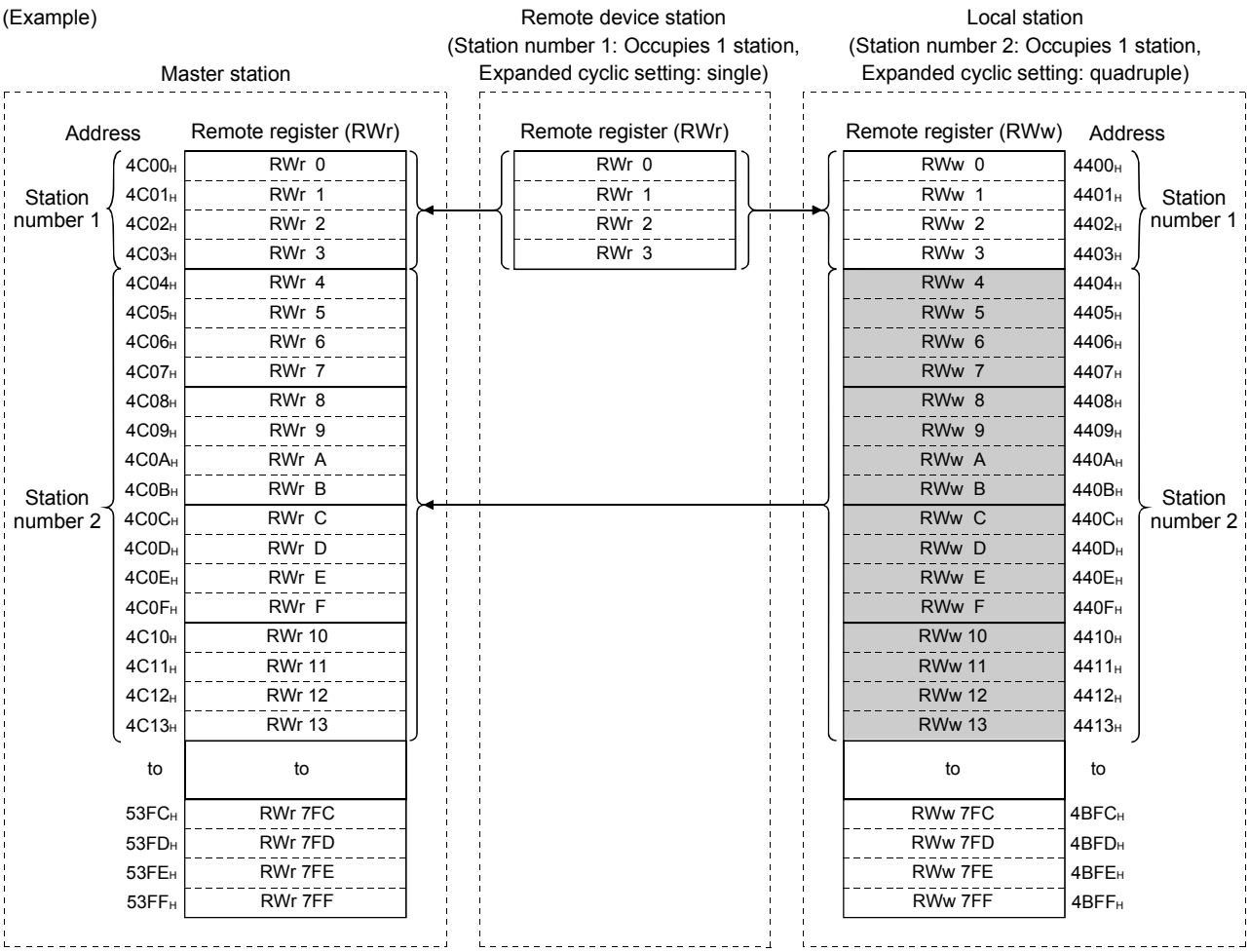
(b) Master station (RWr) ← remote device station (RWr)/local station (RWw)

1) Master station

- The send data from the remote register (RWr) of the remote device station and the remote register (RWw) of the local station is stored.
- When 1 station is occupied, any of 4 to 32 words are used. The number of used points changes depending on the expanded cyclic setting and the occupied station count. (refer to Section 3.2)

2) Local station

- Data is sent to the master station and other local stations by storing it in the address corresponding to the host station number.
- Data in the remote register (RWr) of the remote device station can also be received.
- When 1 station is occupied, any of 4 to 32 words are used. The number of used points changes depending on the expanded cyclic setting and the occupied station count. (refer to Section 3.2)



Appendix 2 Link special relays (SB) and link special registers (SW)

The status of the data link can be confirmed by bit information (link special relays (SB)) and word information (link special registers (SW)).

- Link special relay (SB) • • • Buffer memory address: 5E0H to 5FFH
- Link special register (SW) • • • Buffer memory address: 600H to 7FFH

POINT

Do not write any data to numbers not listed in the list of link special relays (SBs) and the list of link special registers (SWs) (buffer memory address).
Doing so may cause the programmable controller systems malfunction.

Appendix 2.1 List of link special relays (SBs)

The data link status can be checked by the bit information (link special relays: SBs).
The values in parentheses in the number column indicate the buffer memory address.
When the standby master station is controlling the data link, the availability of the link's special relays is basically identical to that of the master station.
When the standby master station is operating as a local station, the availability of the link's special relays is identical to that of a local station.

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0000 (5E0H, b0)	Data link restart	Restarts the data link that had been stopped by SB0002. OFF: Restart not instructed ON : Restart instructed	○	○	×
SB0001 (5E0H, b1)	Refresh instruction at standby master switching	Instructs to perform cyclic data refresh after the data link control is transferred to the standby master station. OFF: Not instructed ON : Instructed	○	×	×
SB0002 (5E0H, b2)	Data link stop	Stops the host data link. (SB0000 is used for restart.) However, when the master station executes this, the entire system will stop. OFF: No stop instruction ON : Stop instructed	○	○	×
SB0003 (5E0H, b3)	Refresh instruction when changing parameters by the dedicated instruction	Instructs to refresh cyclic data after changing parameters by the RLPASET instruction. OFF: Not instructed (stop refreshing) ON : Instructed (start/continue refreshing)	○	○	×
SB0004 (5E0H, b4)	Temporary error invalid request	Establishes the stations specified by SW0003 to SW0007 as temporary error invalid stations. The execution result of the request is stored to SW0049. OFF: Not requested ON : Requested	○	×	×
SB0005 (5E0H, b5)	Temporary error invalid canceling request	Cancels the temporary error invalid status of stations specified by SW0003 to SW0007. The execution result of the request is stored to SW004B. OFF: Not requested ON : Requested	○	×	×
SB0008 (5E0H, b8)	Line test request	Executes line tests for the stations specified by SW0008. The execution result of the request is stored to SW004D. OFF: Not requested ON : Requested	○	×	×

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0009 (5E0H, b9)	Parameter information read request	Reads the parameter setting information for the actual system configuration. The execution result of the request is stored to SW004F. OFF: Normal ON : Abnormal	○	×	×
SB000C (5E0H, b12)	Forced master switching	Forcefully transfers the data link control from the standby master station that is controlling the data link to the standby master station in case the standby master station becomes faulty. OFF: Not requested ON : Requested	○ *2	×	×
SB000D (5E0H, b13)	Remote device station initialization procedure registration instruction	Starts the initial processing using the information registered during the initialization procedure registration. While SB000D is on, the refresh of the remote input/output and remote registers stops. OFF: Not instructed ON : Instructed	○ *1	×	×
SB0020 (5E2H, b0)	Board status	Stores the communication status between CC-Link Ver.2 board and personal computer. OFF: Normal ON : Abnormal	○	○	○
SB0040 (5E4H, b0)	Data link restart acceptance	Indicates the data link restart instruction acknowledgment status. OFF: Not acknowledged ON : Startup instruction acknowledged	○	○	×
SB0041 (5E4H, b1)	Data link restart complete	Indicates the data link restart instruction acknowledgment completion status. OFF: Not complete ON : Startup complete	○	○	×
SB0042 (5E4H, b2)	Refresh instruction acknowledgment status at standby master switching	Indicates whether or not the refresh instruction at standby master switching have been acknowledged. OFF: Not executed ON : Instruction acknowledged	○	×	×
SB0043 (5E4H, b3)	Refresh instruction complete status at standby master switching	Indicates whether or not the refresh instruction at standby master switching is complete. OFF: Not executed ON : Switching complete	○	×	×
SB0044 (5E4H, b4)	Data link stop acceptance	Indicates the data link stop instruction acknowledgment status. OFF: Not acknowledged ON : Stop instruction acknowledged	○	○	×
SB0045 (5E4H, b5)	Data link stop complete	Indicates the data link stop instruction acknowledgment completion status. OFF: Not complete ON : Stop complete	○	○	×
SB0046 (5E4H, b6)	Forced master switching executable status	Indicates whether the forced master switching (SB000C) signal can be executed or not. OFF: Cannot be executed ON : Can be executed	○ *2	×	×
SB0048 (5E4H, b8)	Temporary error invalid acceptance status	Indicates the acknowledgement status temporary error invalid instruction. OFF: Not executed ON : Instruction acknowledged	○	×	×
SB0049 (5E4H, b9)	Temporary error invalid complete status	Indicates the acknowledgement completion status temporary error invalid instruction. OFF: Not executed ON : Temporary error invalid station established/Specified station number is invalid	○	×	×
SB004A (5E4H, b10)	Temporary error invalid canceling acknowledgment status	Indicates the acknowledgement status temporary error invalid cancel instruction. OFF: Not executed ON : Instruction acknowledged	○	×	×

*1: Can be used for the master station only.
*2: Can be used for the standby master station only.

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB004B (5E4H, b11)	Temporary error invalid canceling complete status	Indicates the acknowledgement completion status temporary error invalid cancel instruction. OFF: Not executed ON : Temporary error invalid station cancellation complete	○	×	×
SB004C (5E4H, b12)	Line test acceptance status	Indicates the line test request acknowledgment status. OFF: Not executed ON : Instruction acknowledged	○	×	×
SB004D (5E4H, b13)	Line test complete status	Indicates the line test completion status. OFF: Not executed ON : Test complete	○	×	×
SB004E (5E4H, b14)	Parameter information read acknowledgment status	Indicates the parameter information read request acknowledgment status. OFF: Not executed ON : Instruction acknowledged	○	×	×
SB004F (5E4H, b15)	Parameter information read completion status	Indicates the completion status of the parameter information read request. OFF: Not executed ON : Test complete	○	×	×
SB0050 (5E5H, b0)	Offline test status	Indicates the offline test execution status. OFF: Not executed ON : In progress	×	×	○
SB005A (5E5H, b10)	Master switching request acknowledgment	Indicates the acknowledgment status of the standby master station when it has received a master switching request from the line. OFF: Not acknowledged ON : Request acknowledged	○	×	×
SB005B (5E5H, b11)	Master switching request complete	Indicates whether or not the switching from the standby master station to master station is complete. OFF: Not complete ON : Complete	○	×	×
SB005C (5E5H, b12)	Forced master switching request acknowledgment	Indicates whether or not a forced master switching request has been acknowledged. OFF: Not acknowledged ON : Instruction acknowledged	○ *2	×	×
SB005D (5E5H, b13)	Forced master switching request complete	Indicates whether or not a forced master switching request is complete. OFF: Not complete ON : Complete	○ *2	×	×
SB005E (5E5H, b14)	Execution status of remote device station initialization procedure	Indicates the execution status of the initialization procedure. OFF: Not executed ON : Being executed	○ *1	×	×
SB005F (5E5H, b15)	Completion status of remote device station initialization procedure	Indicates the completion status of the initialization procedure execution. OFF: Not complete ON : Complete	○ *1	×	×
SB0060 (5E6H, b0)	Host mode	Indicates the mode setting status of the host. OFF: Online ON : Other than online	○	○	○
SB0061 (5E6H, b1)	Host type	Indicates the station type of the host. OFF: Master station (station number 0) ON : Local station (station numbers 1 to 64)	○	○	×
SB0062 (5E6H, b2)	Host standby master station setting status	Indicates whether or not the standby master station setting exists for the host. OFF: No setting ON : Setting exists	○	○	○

*1: Can be used for the master station only.

*2: Can be used for the standby master station only.

<table>
<tr><th rowspan="2">Number</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="3">Availability
(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SB0065
(5E6H, b5)</td><td>Input data status of host data link faulty station</td><td>Indicates the input status setting from a data link faulty station of the host.
OFF: Clear
ON : Hold</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0066
(5E6H, b6)

SB0067
(5E6H, b7)</td><td>Number of host occupied stations</td><td>Indicates the setting status of host occupied stations.
<table><tr><th>Number of occupied station</th><th>SB0066</th><th>SB0067</th></tr><tr><td>1 station</td><td>OFF</td><td>OFF</td></tr><tr><td>2 stations</td><td>OFF</td><td>ON</td></tr><tr><td>3 stations</td><td>ON</td><td>ON</td></tr><tr><td>4 stations</td><td>ON</td><td>OFF</td></tr></table></td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>SB006A
(5E6H, b10)</td><td>Switch setting status</td><td>Indicates the setting status of the host.
OFF: Normal
ON : Setting error exists (the error code is stored in SW006A)</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SB006D
(5E6H, b13)</td><td>Parameter setting status</td><td>Indicates the parameter setting status.
OFF: Normal
ON : Setting error exists (the error code is stored in SW0068)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB006E
(5E6H, b14)</td><td>Host station operation status</td><td>Indicates the host data link operation status.
OFF: Being executed
ON : Not executed</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0070
(5E7H, b0)</td><td>Master station information</td><td>Indicates the data link status.
OFF: Data link control by the master station
ON : Data link control by the standby master station</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0071
(5E7H, b1)</td><td>Standby master station information</td><td>Indicates whether or not a standby master station is present.
OFF: Not present
ON : Present</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0072
(5E7H, b2)</td><td>Scan mode setting information</td><td>Indicates the scan mode setting information.
OFF: Asynchronous mode
ON : Synchronous mode</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SB0073
(5E7H, b3)</td><td>Operation specification when CPU is down status</td><td>Indicates the operation specification status using a parameter when the CPU is down.
OFF: Stop
ON : Continue</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SB0074
(5E7H, b4)</td><td>Reserved station specified status</td><td>Indicates the reserved station specification status using a parameter.
OFF: No specification
ON : Specification exists (information is stored in SW0074 to SW0077)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0075
(5E7H, b5)</td><td>Error invalid station specified status</td><td>Indicates the error invalid station specification status using a parameter.
OFF: No specification
ON : Specification exists (information is stored in SW0078 to SW007B)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0076
(5E7H, b6)</td><td>Temporary error invalid station setting information</td><td>Indicates whether there is a temporary error invalid station setting.
OFF: No setting
ON : Setting exists (information is stored in SW007C to SW007F)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0077
(5E7H, b7)</td><td>Parameter receive status</td><td>Indicates the parameter receive status from the master station.
OFF: Reception complete
ON : Reception not complete</td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>SB0079
(5E7H, b9)</td><td>Master station return specification information</td><td>Indicates whether the "Type" setting of the host operates is set to "Master station" or "Master station (Duplex function)."
OFF: Master station
ON : Master station (Duplex function)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SB007B
(5E7H, b11)</td><td>Host master/standby master operation status</td><td>Indicates whether the host operates as the master or standby master station.
OFF: Operates as the master station (controlling data link)
ON : Operates as the standby master station (standby)</td><td>○</td><td>○</td><td>×</td></tr>
</table>

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB007C (5E7H, b12)	Slave station refresh/forced clear setting status in case of programmable controller CPU STOP	Indicates the parameter-set slave station refresh/ forced clear setting status in case of programmable controller CPU STOP. OFF: Refresh ON : Clears compulsorily	○	×	×
SB0080 (5E8H, b0)	Other station data link status	Indicates the communication status between remote/local/intelligent device/standby master stations. OFF: All stations normal ON : Faulty station exists (information is stored in SW0080 to SW0083)	○	○	×
SB0081 (5E8H, b1)	Other station watchdog timer error status	Indicates the occurrence of a watchdog timer error in other stations. (SW0084 to SW0087) OFF: No error ON : Error occurrence	○	○	×
SB0082 (5E8H, b2)	Other station fuse blown status	Indicates the fuse blown occurrence status at other stations. (SW0088 to SW008B) OFF: No error ON : Error occurrence	○	○	×
SB0083 (5E8H, b3)	Other station switch change status	Detects changes in setting switches of other stations during data linking. (SW008C to SW008F) OFF: No change ON : Change detected	○	○	×
SB0090 (5E9H, b0)	Host line status	Indicates the line status of the host. OFF: Normal ON : Abnormal (line disconnection)	×	○	×
SB0094 (5E9H, b4)	Transient transmission status	Indicates whether there is a transient transmission error. (SW0094 to SW0097) OFF: No error ON : Error occurrence	○	○	×
SB0095 (5E9H, b5)	Master station transient transmission status	Indicates the transient transmission status of the master station. OFF: Normal ON : Abnormal	×	○	×
SB00B4 (5EBH, b4)	Standby master station test result	Stores the test result of Line test 1/Line test 2. OFF: Normal ON : Abnormal	○	×	○

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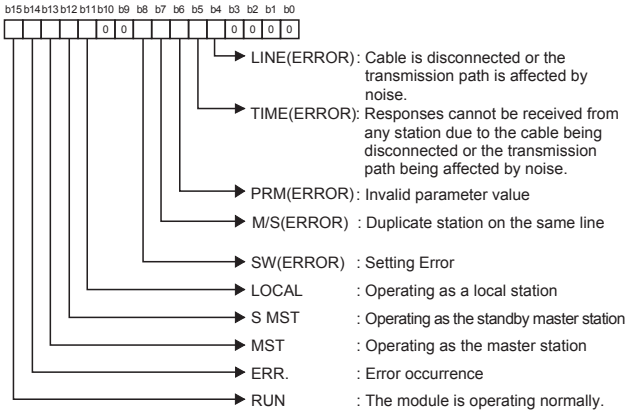
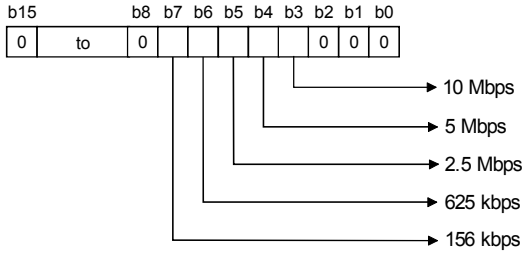
Appendix 2.2 List of link special registers (SWs)

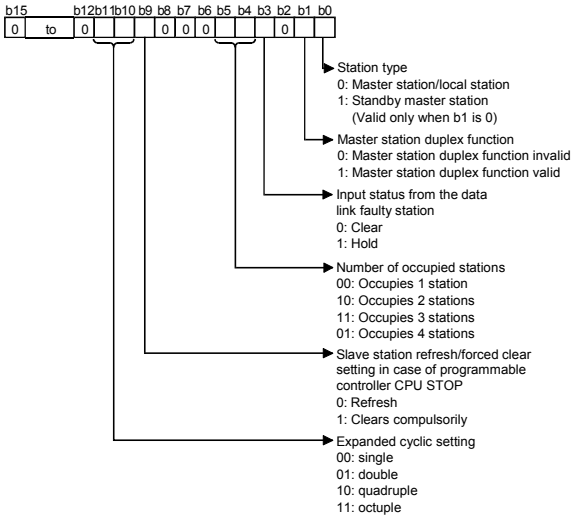
The data link status can be checked by the word information (link special registers: SWs).
When the standby master station is controlling the data link, availability is basically identical to that of the master station.
When the standby master station is operating as a local station, availability is identical to that of a local station.

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0003
(603H)</td><td>Multiple temporary error invalid station specification</td><td>Select whether multiple temporary error invalid stations are specified.
00 : Specifies multiple stations indicated by SW0004 to SW0007.
01 to 64: Specifies a single station from 1 to 64.
(The specified number indicates the station number of a temporary error invalid station.)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0004
(604H)
SW0005
(605H)
SW0006
(606H)
SW0007
(607H)</td><td>Temporary error invalid station specification *1</td><td>Specifies a temporary error invalid station.
0: Not specified as a temporary error invalid station
1: Specified as a temporary error invalid station
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0004</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0005</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0006</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0007</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0008
(608H)</td><td>Line test station setting</td><td>Sets the station for which line tests are executed.
0 : Entire system (executed for all stations)
01 to 64 : Specified station only
Default value : 0</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0009
(609H)</td><td>Monitoring time setting</td><td>Sets the monitoring time when a dedicated instruction is used.
Default value : 10 (seconds)
Setting range : 0 to 360 (seconds)
The monitoring time of 360 seconds will be used if a value outside of the above setting range is specified.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW000A
(60AH)</td><td>CPU monitoring time setting</td><td>Sets the CPU response monitoring time when the CPU is accessed with a dedicated instruction.
Default value : 90 (seconds)
Setting range : 0 to 3600 (seconds)
The monitoring time of 3600 seconds will be used if a value outside of the above setting range is specified.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0020
(620H)</td><td>Module status</td><td>Stores the communication status between CC-Link Ver.2 board and personal computer.
0 : Normal
Other than 0 : Stores the error code
(refer to MELSEC Data Link Library Reference Manual).</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SW0041
(641H)</td><td>Data link restart result</td><td>Stores the execution result of the data link restart instruction with SB0000.
0 : Normal
Other than 0 : Stores the error code (refer to Chapter 15).</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0043
(643H)</td><td>Refresh instruction at standby master switching result</td><td>Indicates the execution result of refresh instruction at standby master switching.
0 : Normal
Other than 0 : Stores the error code (refer to Chapter 15).</td><td>○</td><td>×</td><td>×</td></tr>
</table>

*1: Only the bit for the first station number is turned on.

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0045 (645H)	Data link stop result	Stores the execution result of the data-link stop instruction with SB0002. 0 : Normal Other than 0: Stores the error code (refer to Chapter 15).	○	○	×
SW0049 (649H)	Temporary error invalid station specification result	Indicates the execution result of temporary error invalid station specification with SB0004. 0 : Normal Other than 0: Stores the error code (refer to Chapter 15).	○	×	×
SW004B (64BH)	Temporary error invalid station specification cancel result	Indicates the execution result of the temporary error invalid station specification cancellation with SB0005. 0 : Normal Other than 0: Stores the error code (refer to Chapter 15).	○	×	×
SW004D (64DH)	Line test result	Indicates the execution result of the line test with SB0008. 0 : Normal Other than 0: Stores the error code (refer to Chapter 15).	○	×	×
SW004F (64FH)	Parameter setting test result	Indicates the execution result of the parameter setting test with SB0009. 0 : Normal Other than 0: Stores the error code (refer to Chapter 15).	○	×	×
SW0052 (652H)	Automatic CC-Link startup execution result	Stores the system configuration check result when a new station is added to a system using an automatic CC-Link startup. 0 : Normal Other than 0: Stores the error code (refer to Chapter 15).	○	×	×
SW0058 (658H)	Detailed LED display status	Stores the details of the LED display status. 0: OFF 1: ON 	○	○	○
SW0059 (659H)	Transmission rate setting	Stores the contents of the transmission rate setting. 0: Cancel 1: Set 	○	○	○
SW005D (65DH)	Forced master switching instruction result	Stores the execution result of the forced master switching instruction with SB000C. 0 : Normal Other than 0: Stores the error code (refer to Chapter 15).	○ *2	×	×

*2: Can be used for the standby master station only.

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW005F (65F$_H$)	Remote device station initialization procedure registration instruction result	Stores the execution result of the initialization procedure registration instruction with SB000B. 0 : Normal Other than 0: Stores the error code (refer to Chapter 15).	○ *3	×	×
SW0060 (660$_H$)	Mode setting status	Stores the mode setting status. 0: Online (with automatic return) 2: Offline 3: Line test 1 4: Line test 2 6: Hardware test	○	○	○
SW0061 (661$_H$)	Host station number	Stores the station number of the host that is currently in operation. 0 : Master station 1 to 64 : Local station	○	○	○
SW0062 (662$_H$)	Module operating status	Stores the operation setting status of the CC-Link Ver.2 board. 	○	○	○
SW0064 (664$_H$)	No. of retries information	Indicates the retry count setting information when there is an error response. 1 to 7 (times)	○	×	×
SW0065 (665$_H$)	No. of automatic return stations	Indicates the setting information for the number of automatic return stations during one link scan. 1 to 10 (stations)	○	×	×
SW0066 (666$_H$)	Delay timer information	Indicates the setting information for the scan interval delay time. 0 to 100 (50 μs)	○	×	×
SW0067 (667$_H$)	Parameter information	Stores the parameter information area to be used. 0$_H$: CPU built-in parameters 3$_H$: Dedicated instruction (parameter setting with the RLPASET instruction and data link startup.) D$_H$: Default parameters (automatically starts CC-Link)	○	×	○
SW0068 (668$_H$)	Host parameter status	Stores the parameter setting status. 0 : Normal Other than 0: Stores the error code (refer to Chapter 15).	○	○	×

*3: Can be used for the master station only.

<table>
<tr><th rowspan="2">Number</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="3">Availability
(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0069
(669H)</td><td>Loading status *4</td><td>Stores the duplicate station number status and parameter matching of each station.
0 : Normal
Other than 0: Stores the error code (refer to Chapter 15).
Details are stored in SW0098 to 9B and SW009C to 9F.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW006A
(66AH)</td><td>Switch setting status</td><td>Stores the switch setting status.
0 : Normal
Other than 0: Stores the error code (refer to Chapter 15).</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SW006D
(66DH)</td><td>Max. link scan time</td><td>Stores the maximum value of the link scan time (in 1 ms units).</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW006E
(66EH)</td><td>Current link scan time</td><td>Stores the current value of the link scan time (in 1 ms units).</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW006F
(66FH)</td><td>Min. link scan time</td><td>Stores the minimum value of the link scan time (in 1 ms units).</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0070
(670H)</td><td>Total number of stations</td><td>Stores the final station number set in the parameter.
1 to 64 (stations)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0071
(671H)</td><td>Max. communication station number</td><td>Stores the maximum station number that is performing data link.
1 to 64 (stations)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0072
(672H)</td><td>Number of connected modules</td><td>Stores the number of modules that are performing data link.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0073
(673H)</td><td>Standby master station number</td><td>Stores the station number of the standby master station.
1 to 64 (stations)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0074
(674H)
SW0075
(675H)
SW0076
(676H)
SW0077
(677H)</td><td>Reserved station specified status *1</td><td>Stores the reserved station setting status.
0: Not reserved station
1: Reserved station
<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0074</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0075</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW0076</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW0077</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0078
(678H)
SW0079
(679H)
SW007A
(67AH)
SW007B
(67BH)</td><td>Error invalid station specified status *1</td><td>Stores the error invalid station setting status.
0: Other than error invalid station
1: Error invalid station
<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0078</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0079</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW007A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW007B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
</table>

*1: Only the bit for the first station number is turned on.

*4: This register checks and stores the status only at link startup.

<table>
<tr><th rowspan="2">Number</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="3">Availability
(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th>Offline</th></tr>
<tr><th></th><th></th><th></th><th>Master station</th><th>Local station</th><th></th></tr>
<tr><td>SW007C (67C_H)
SW007D (67D_H)
SW007E (67E_H)
SW007F (67F_H)</td><td>Temporary error invalid status *5</td><td>Indicates the temporary error invalid status.
0: Normal status
1: Temporary error invalid status
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW007C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW007D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW007E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW007F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0080 (680_H)
SW0081 (681_H)
SW0082 (682_H)
SW0083 (683_H)</td><td>Other station data link status *5</td><td>Stores the data link status of each station.
0: Normal
1: Data link error occurrence
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0080</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0081</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0082</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0083</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0084 (684_H)
SW0085 (685_H)
SW0086 (686_H)
SW0087 (687_H)</td><td>Other station watchdog timer error occurrence status *1</td><td>Indicates the watchdog timer error status on each station.
0: No watchdog timer error
1: Watchdog timer error occurrence
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0084</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0085</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0086</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0087</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0088 (688_H)
SW0089 (689_H)
SW008A (68A_H)
SW008B (68B_H)</td><td>Other station fuse blown status *5</td><td>Stores the fuse blown occurrence status of each station.
0: Normal
1: Abnormal
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0088</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0089</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW008A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW008B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW008C (68C_H)
SW008D (68D_H)
SW008E (68E_H)
SW008F (68F_H)</td><td>Other station switch change status *1</td><td>Indicates the switch change status of other stations performing data link.
0: No change
1: Change occurred
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW008C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW008D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW008E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW008F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
</table>

*1: Only the bit for the first station number is turned on.

*5: Bits for the number of occupied stations are turned on.

<table>
<tr><th rowspan="2">Number</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="3">Availability
(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0090
(690H)</td><td>Line status</td><td>Stores the line status.
0: Normal
1: Data link cannot be performed (disconnected)</td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>SW0094
(694H)
SW0095
(695H)
SW0096
(696H)
SW0097
(697H)</td><td>Transient transmission status *1</td><td>Indicates the occurrence status of a transient transmission error.
0: No transient transmission error
1: Transient transmission error occurrence
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0094</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0095</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0096</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0097</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0098
(698H)
SW0099
(699H)
SW009A
(69AH)
SW009B
(69BH)</td><td>Station number overlap status *6</td><td>Stores the overlap status when the first station number of each module is not overlapped.
0: Normal
1: Overlap station number (first station number only)
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0098</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0099</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW009A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW009B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW009C
(69CH)
SW009D
(69DH)
SW009E
(69EH)
SW009F
(69FH)</td><td>Loading/parameter consistency status *6</td><td>Stores the consistency status between the loaded station and the parameter settings.
A matching error occurs in any of the following cases.
1) Station type mismatch *
2) Number of occupied stations mismatch
3) Expanded cyclic setting mismatch *
4) CC-Link compatible version mismatch
* A matching error will not occur when installation ≤ parameter. (For example, a matching error will not occur when a remote device station is installed and the parameter setting is an intelligent device station.)
0: Normal
1: Matching error
Example of matching error
<table><tr><th>Installation</th><th>Parameter</th></tr><tr><td>Remote device station</td><td>Remote I/O station</td></tr><tr><td rowspan="2">Intelligent device station</td><td>Remote I/O station</td></tr><tr><td>Remote device station</td></tr></table><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW009C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW009D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW009E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW009F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
</table>

*1: Only the bit for the first station number is turned on.

*6: Only the bit for the first station number is turned on. In addition, these registers check and store the status at link startup.

<table>
<tr><th rowspan="2">Number</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="3">Availability
(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW00B4 (6B4H)
SW00B5 (6B5H)
SW00B6 (6B6H)
SW00B7 (6B7H)</td><td>Line test 1 result *5</td><td>Stores the line test 1 result.
0: Normal
1: Abnormal
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW00B4</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00B5</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00B6</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00B7</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>○</td></tr>
<tr><td>SW00B8 (6B8H)</td><td>Line test result</td><td>Stores the line test 1/line test 2 result.
0 : Normal
Other than 0: Stores the error code (refer to Chapter 15).</td><td>×</td><td>×</td><td>○</td></tr>
<tr><td>SW0140 (740H)
SW0141 (741H)
SW0142 (742H)
SW0143 (743H)</td><td>Compatible CC-Link ver. information *6</td><td>Indicates the slave stations compatible with CC-Link Ver.2.
0: Ver.1 compatible slave station
1: Ver.2 compatible slave station
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0140</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0141</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0142</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0143</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0144 (744H)
SW0145 (745H)
SW0146 (746H)
SW0147 (747H)</td><td>CC-Link ver. installation/parameter matching status *6</td><td>Stores the CC-Link version matching status of the parameters and slave stations.
0: Normal
1: Matching error
Example of matching error
<table><tr><th>Installation</th><th>Parameter</th></tr><tr><td>Ver.2compatible remote device station</td><td>Ver.1compatible remote device station</td></tr><tr><td>Ver.1compatible remote device station</td><td>Ver.2compatible remote device station</td></tr></table><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0144</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0145</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0146</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0147</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0148 (748H)</td><td>Parameter mode</td><td>Indicates in which mode the system is operating.
0: Remote net ver.1 mode
1: Remote net additional mode
2: Remote net ver.2 mode</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0149 (749H)</td><td>Host parameter mode</td><td>Indicates in which mode the host is operating.
0: Remote net ver.1 mode
1: Remote net additional mode
2: Remote net ver.2 mode</td><td>○</td><td>○</td><td>○</td></tr>
</table>

*5: Bits for the number of occupied stations are turned on.

*6: Only the bit for the first station number is turned on. In addition, these registers check and store the status at link startup.

The update timing of the data in a link special register (SW) differs depending on the link register number.
The following table shows the update timings of the link special registers.

Link special register	Data update timing	Link special register	Data update timing
SW0041	Updated individually regardless of the SB.	SW0071	Updated individually regardless of the SB. (Updated after each station reaches a stable condition.)
SW0045		SW0072	
SW0060	When the SB0060 changes.	SW0074 to SW0077	When the SB0074 changes.
SW0061	When the SB0061 changes.	SW0078 to SW007B	When the SB0075 changes.
SW0062	Updated individually regardless of the SB.	SW0080 to SW0083	When the SB0080 changes.
SW0067		SW0088 to SW008B	Updated individually regardless of the SB.
SW0068		SW0090	When the SB0090 changes.
SW0069		SW0098 to SW009B	Updated individually regardless of the SB.
SW006A		SW009C to SW009F	
SW006D		SW00B4 to SW00B7	
SW006E		SW00B8	
SW006F		SW00B9	
SW0070		—	—

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Appendix 3 Data link processing time

This chapter explains the data link processing times such as the link scan time and transmission delay time.

Appendix 3.1 Link scan time

This section shows the CC-Link scan time calculation method.

[Link scan time (LS)]

LS = BT {29.4 + (NI × 4.8) + (NW × 9.6) + (N × 32.4) + (ni × 4.8) + (nw × 9.6)} + ST + F [μs]

BT: Constant (transmission rate)

Transmission rate	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
BT	51.2	12.8	3.2	1.6	0.8

NI: The final station number among a, b and c
(This value includes the number of occupied stations but excludes reserved stations, and must be a multiple of 8.)
- a: Total number of occupied stations for remote I/O stations
- b: Total number of occupied stations for remote device stations
- c: Total number of occupied stations for local stations, standby master station and intelligent device stations

NW: The final station number between b and c
(This value includes the number of occupied stations but excludes reserved stations, and must be a multiple of 8.)

Final station number	1 to 8	9 to 16	17 to 24	25 to 32	33 to 40	41 to 48	49 to 56	57 to 64
NI, NW	8	16	24	32	40	48	56	64

N: Number of connected stations (excluding reserved stations)

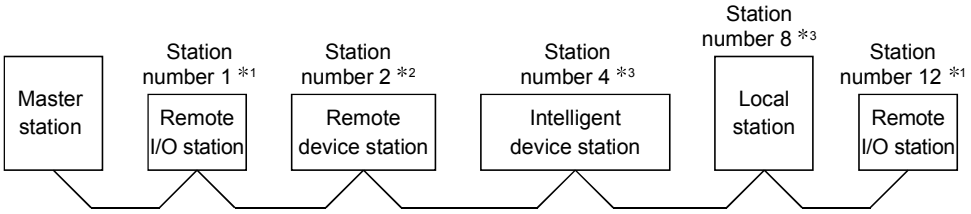
ni: a + b+ c (excluding reserved stations)

nw: b + c (excluding reserved stations)

ST: Constant
(Must be the largest value among 1) to 3) below. However, 2) is disregarded when b = 0 and 3) is disregarded when c = 0.)
1) 800 + (a × 15)
2) 900 + (b × 50)
3) When c < 26: 1200 + (c × 100)
   When c > 26: 3700 + {(c - 26) × 25}

F: Return processing time {only when there is a faulty station (including error invalid and temporary error invalid stations)}
Number of faulty stations × 48 × BT × (retry count)

(Example) Using the following system configuration example when the transmission rate is 10 Mbps (assuming that there is no faulty station or transient transmission.)



*1: Occupies 1 station *2: Occupies 2 stations *3: Occupies 4 stations

BT = 0.8	ST = 2000
NI = 12→16	1) 800 + (2 × 15) = 830
NW = 11→16	2) 900 + (2 × 50) = 1000
N = 5	3) 1200 + (8 × 100) = 2000
ni = 12	a = 2, b = 2, c = 8
nw = 10	

LS = 0.8 {29.4 + (16 × 4.8) + (16 × 9.6) + (5 × 32.4) + (12 × 4.8) + (10 × 9.6)} + 2000
= 2556.2 [μs]
= 2.56 [ms]

Appendix 3.2 Cyclic transmission processing time

This section shows the transmission processing time taken when data of remote input (RX), remote output (RY) and remote register (RWw, RWr) are transferred by cyclic transmission.

When calculating the transmission delay time, the following processing time must be added to the cyclic transmission processing time shown in this section.

- The execution cycle time of reading/writing
- The own station access processing time by the md function (Refer to POINT.)

POINT

The own station access processing time by the md function differs according to the performance/ loaded condition of the personal computer and the type of the CC-Link Ver.2 board.
The following table shows the example of the processing time of the personal computer. Use it as a guide.

1024 bytes own station access processing time

Personal computer CPU specification	Reading data from own station (mdReceive)		Writing data to own station (mdSend)	
	Q80BD-J61BT11N	Q81BD-J61BT11	Q80BD-J61BT11N	Q81BD-J61BT11
Pentium II (233MHz)	1.2ms	—	0.5ms	—
Pentium III (533MHz)	0.6ms	—	0.2ms	—
Pentium4 (3GHz)	0.3ms	—	0.1ms	—
PentiumD (2.8GHz)	0.35ms	0.65ms	0.1ms	0.1ms
Intel Core2Duo (1.86GHz)	0.3ms	0.6ms	0.1ms	0.1ms

[1] In the case of block data assurance per station is disabled

(1) Master station (CC-Link Ver.2 board) ↔ remote I/O station

(a) Master station (CC-Link Ver.2 board) (RX) ← Remote I/O station (input)

The following formula indicates the time taken from the moment a signal is input to the remote I/O station until RX of the master station (CC-Link Ver.2 board) turns on (off).

[Formula]

[Normal value]

LS × 1 + Remote I/O station response time [ms] (*1)

LS: Link scan time (refer to Appendix 3.1)

(Example) When the link scan time is 3 ms and the remote I/O station response time is 1.5 ms:

LS × 1 + Remote I/O station response time [ms]
= 3 × 1 + 1.5
= 4.5 [ms]

[Maximum value]

LS × 2 + Remote I/O station response time [ms] (*1)

LS: Link scan time (refer to Appendix 3.1)

(Example) When the link scan time is 3 ms and the remote I/O station response time is 1.5 ms:

LS × 2 + Remote I/O station response time [ms]
= 3 × 2 + 1.5
= 7.5 [ms]

*1: When reading RX from the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

(b) Master station (CC-Link Ver.2 board) (RY) → Remote I/O station (output)

The following formula indicates the time taken from the moment RY of the master station (CC-Link Ver.2 board) turns on (off) until the remote I/O station output turns on (off).

[Formula]

[Normal value]

LS × 1 + Remote I/O station response time [ms] (*2)

LS: Link scan time (refer to Appendix 3.1)

(Example) When the link scan time is 3 ms and the remote I/O station response time is 1.5 ms:

LS × 1 + Remote I/O station response time [ms]

= 3 × 1 + 1.5

= 4.5 [ms]

[Maximum value]

LS × 2 + Remote I/O station response time [ms] (*2)

LS: Link scan time (refer to Appendix 3.1)

(Example) When the link scan time is 3 ms and the remote I/O station response time is 1.5 ms:

LS × 2 + Remote I/O station response time [ms]

= 3 × 2 + 1.5

= 7.5 [ms]

*2: When writing RY to the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

(2) Master station (CC-Link Ver.2 board) ↔ remote device station (Ver.2 compatible slave station)

(a) Master station (CC-Link Ver.2 board) (RX) ← Remote device station (RX)

The following formula indicates the time taken from the moment a signal is input to the remote device station until RX of the master station (CC-Link Ver.2 board) turns on (off). (∗1)

[Formula]

[Normal value]

LS × (1×(2×n -1)+1) + Remote device station processing time [ms] (∗2)

LS: Link scan time (refer to refer to Appendix 3.1)

n: Expanded cyclic setting (n time setup)
Note that n=1 is used for a Ver.1 compatible slave station.

(Example) When the link scan time is 3 ms and the expanded cyclic setting is "double" and the remote device station processing time is 1.5 ms:

LS × (1×(2×n-1)+1) + Remote device station processing time [ms]
= 3 × (1×(2×2-1)+1) + 1.5
= 13.5 [ms]

[Maximum value]

LS × (2×(2×n-1)+1) + Remote device station processing time [ms] (∗2)

LS: Link scan time (refer to refer to Appendix 3.1)

n: Expanded cyclic setting (n time setup)
Note that n=1 is used for a Ver.1 compatible slave station.

(Example) When the link scan time is 3 ms and the expanded cyclic setting is "double" and the remote device station processing time is 1.5 ms:

LS × (2×(2×n-1)+1) + Remote device station processing time [ms]
= 3 × (2×(2×2-1)+1) + 1.5
= 22.5 [ms]

∗1: The above one is shown by the example of the remote device station (RX), but it is also applicable for the remote device station (RWr).

∗2: When reading RX from the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

(b) Master station (CC-Link Ver.2 board) (RY) → Remote device station (RY)

The following formula indicates the time taken from the moment RY of the master station (CC-Link Ver.2 board) turns on (off) until the remote device station output turns on (off). (*3)

[Formula]

[Normal value]

LS × (1×(2×n-1)+1) + Remote device station processing time [ms] (*4)

LS: Link scan time (refer to Appendix 3.1)

n: Expanded cyclic setting (n time setup)
Note that n=1 is used for a Ver.1 compatible slave station.

(Example) When the link scan time is 3 ms and the expanded cyclic setting is "double" and the remote device station processing time is 1.5 ms:

LS × (1×(2×n-1)+1) + Remote device station processing time [ms]
= 3 × (1×(2×2-1)+1) + 1.5
= 13.5 [ms]

[Maximum value]

LS × (2×(2×n-1)+1) + Remote device station processing time [ms] (*4)

LS: Link scan time (refer to Appendix 3.1)

n: Expanded cyclic setting (n time setup)
Note that n=1 is used for a Ver.1 compatible slave station.

(Example) When the link scan time is 3 ms and the expanded cyclic setting is "double" and the remote device station processing time is 1.5 ms:

LS × (2×(2×n-1)+1) + Remote device station processing time [ms]
= 3 × (2×(2×2-1)+1) + 1.5
= 22.5 [ms]

*3: The above one is shown by the example of the remote device station (RY), but it is also applicable for the remote device station (RWw).

*4: When writing RY to the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

(3) Master station (CC-Link Ver.2 board) ↔ local station (programmable controller) (Ver.2 compatible slave station)

(a) Master station (CC-Link Ver.2 board) (RX) ← Local station (programmable controller) (RY)

The following formula indicates the time taken from the moment a local station's CPU device turns on (off) until RX of the master station (CC-Link Ver.2 board) turns on (off). (∗1)

[Formula]

[Normal value]

LS × (1×(2×n-1)+1) + SL [ms] (∗2)

LS: Link scan time (refer to Appendix 3.1)

SL: Local station sequence program scan time

n: Expanded cyclic setting (n time setup)

Note that n=1 is used for a Ver.1 compatible slave station.

(Example) When the link scan time is 3 ms and the expanded cyclic setting is "double" and the local station's sequence scan time is 10 ms:

LS × (1×(2×n-1)+1) + SL [ms]

= 3 × (1×(2×2-1)+1) + 10

= 22 [ms]

[Maximum value]

LS × (2×(2×n-1)+1) + SL [ms] (∗2)

LS: Link scan time (refer to Appendix 3.1)

SL: Local station sequence program scan time

n: Expanded cyclic setting (n time setup)

Note that n=1 is used for a Ver.1 compatible slave station.

(Example) When the link scan time is 3 ms and the expanded cyclic setting is "double" and the local station's sequence scan time is 10 ms:

LS × (2×(2×n-1)+1) + SL [ms]

= 3 × (2×(2×2-1)+1) + 10

= 31 [ms]

∗1: The above one is shown by the example of the remote device station (RX, RY), but it is also applicable for the remote device station (RWr, RWw).

∗2: When reading RX from the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

(b) Master station (CC-Link Ver.2 board) (RY) → Local station (programmable controller) (RX)

The following formula indicates the time taken from the moment RY of the master station (CC-Link Ver.2 board) turns on (off) until the local station's CPU device turns on (off). (∗3)

[Formula]

[Normal value]

LS × (1×(2×n-1)+1) + SL [ms] (∗4)

LS: Link scan time (refer to Appendix 3.1)

SL: Local station's sequence program scan time

n: Expanded cyclic setting (n time setup)

Note that n=1 is used for a Ver.1 compatible slave station.

(Example) When the link scan time is 3 ms and the expanded cyclic setting is "double" and the local station's sequence scan time is 10 ms:

LS × (1×(2×n-1)+1) + SL [ms]

= 3 × (1×(2×2-1)+1) + 10

= 22 [ms]

[Maximum value]

LS × (2×(2×n-1)+1) + SL [ms] (∗4)

LS: Link scan time (refer to Appendix 3.1)

SL: Local station's sequence program scan time

n: Expanded cyclic setting (n time setup)

Note that n=1 is used for a Ver.1 compatible slave station.

(Example) When the link scan time is 3 ms and the expanded cyclic setting is "double" and the local station's sequence scan time is 10 ms:

LS × (2×(2×n-1)+1) + SL [ms]

= 3 × (2×(2×2-1)+1) + 10

= 31 [ms]

∗3: The above one is shown by the example of the remote device station (RX, RY), but it is also applicable for the remote device station (RWr, RWw).

∗4: When writing RY to the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

(4) Master station (CC-Link Ver.2 board) ↔ intelligent device station

The transmission delay time between the master station (CC-Link Ver.2 board) and the intelligent device station varies depending on the type of intelligent device station used.

Refer to the User's Manual for the intelligent device module to be used.

Notes

- When reading RX and RWr from the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.
- When writing RY and RWw to the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

POINT

The own station access processing time by the md function varies depending on the performance of the personal computer, load status and other factors.

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[2] In the case of block data assurance per station is enabled

(1) Master station (CC-Link Ver.2 board) ↔ remote I/O station

(a) Master station (CC-Link Ver.2 board) (RX) ← Remote I/O station (input)

The following formula indicates the time taken from the moment a signal is input to the remote I/O station until RX of the master station (CC-Link Ver.2 board) turns on (off).

[Formula]

[Normal value]

Iu + α1 + (LR × m) + (LS × 1) + Remote I/O station response time [ms] (∗1)

[Maximum value]

Iu + α1 + (LR × m) + (LS × 2) + Remote I/O station response time [ms] (∗1)

Iu : Reading execution interval of the user program
α1: Request processing time of the personal computer
LR: Link refresh time
LS: Link scan time (refer to Appendix 3.1)
m: LS/LR (However, the decimal point is rounded up)

∗1: When reading RX from the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

(b) Master station (CC-Link Ver.2 board) (RY) → Remote I/O station (output)

The following formula indicates the time taken from the moment RY of the master station (CC-Link Ver.2 board) turns on (off) until the remote I/O station output turns on (off).

[Formula]

[Normal value]

α1 + (LR × m) + (LS × 1) + Remote I/O station response time [ms] (∗2)

[Maximum value]

α1 + (LR × m) + (LS × 2) + Remote I/O station response time [ms] (∗2)

α1: Request processing time of the personal computer
LR: Link refresh time
LS: Link scan time (refer to Appendix 3.1)
m: LS/LR (However, the decimal point is rounded up)

∗2: When writing RY to the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

(2) Master station (CC-Link Ver.2 board) ↔ remote device station (Ver.2 compatible slave station)

(a) Master station (CC-Link Ver.2 board) (RX) ← Remote device station (RX)

The following formula indicates the time taken from the moment a signal is input to the remote device station until RX of the master station (CC-Link Ver.2 board) turns on (off). (∗1)

[Formula]

[Normal value]

Iu + α1 + (LR × m) + {LS × 1× (2×n - 1)} + Remote I/O station response time [ms] (∗2)

[Maximum value]

Iu + α1 + (LR × m) + {LS × 2× (2×n - 1)} + Remote I/O station response time [ms] (∗2)

Iu : Reading execution interval of the user program
α1: Request processing time of the personal computer
LR: Link refresh time
LS: Link scan time (refer to Appendix 3.1)
m: LS/LR (However, the decimal point is rounded up)
n: Expanded cyclic setting (n time setup)
Note that n=1 is used for a Ver.1 compatible slave station.

∗1: The above one is shown by the example of the remote device station (RX), but it is also applicable for the remote device station (RWr).

∗2: When reading RX from the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

(b) Master station (CC-Link Ver.2 board) (RY) → Remote device station (RY)

The following formula indicates the time taken from the moment RY of the master station (CC-Link Ver.2 board) turns on (off) until the remote device station output turns on (off). (*3)

[Formula]

[Normal value]

α1 + (LR × m) + LS × (1× (2×n -1) + 1) + Remote I/O station response time [ms] (*4)

[Maximum value]

α1 + (LR × m) + LS × (2× (2×n -1) + 1) + Remote I/O station response time [ms] (*4)

α1: Request processing time of the personal computer
LR: Link refresh time
LS: Link scan time (refer to Appendix 3.1)
m: LS/LR (However, the decimal point is rounded up)
n: Expanded cyclic setting (n time setup)
Note that n=1 is used for a Ver.1 compatible slave station.

*3: The above one is shown by the example of the remote device station (RY), but it is also applicable for the remote device station (RWw).

*4: When writing RY to the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

(3) Master station (CC-Link Ver.2 board) ↔ local station (programmable controller) (Ver.2 compatible slave station)

(a) Master station (CC-Link Ver.2 board) (RX) ← Local station (programmable controller) (RY)

The following formula indicates the time taken from the moment a local station's CPU device turns on (off) until RX of the master station (CC-Link Ver.2 board) turns on (off). (∗1)

[Formula]

[Normal value]

lu + α1 + (LR × m) + LS × (1×(2×n-1)+1) +{SL×(k+1)} [ms] (∗2)

[Maximum value]

lu + α1 + (LR × m) + LS × (2×(2×n-1)+1) +{SL×(k+1)} [ms] (∗2)

lu : Reading execution interval of the user program
α1: Request processing time of the personal computer
LR: Link refresh time
LS: Link scan time (refer to Appendix 3.1)
SL: Local station sequence program scan time
k: LS/SL (However, the decimal point is rounded up)
m: LS/LR (However, the decimal point is rounded up)
n: Expanded cyclic setting (n time setup)
Note that n=1 is used for a Ver.1 compatible slave station.

∗1: The above one is shown by the example of the remote device station (RX, RY), but it is also applicable for the remote device station (RWr, RWw).

∗2: When reading RX from the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

(b) Master station (CC-Link Ver.2 board) (RY) → Local station (programmable controller) (RX)

The following formula indicates the time taken from the moment RY of the master station (CC-Link Ver.2 board) turns on (off) until the local station's CPU device turns on (off). (∗3)

[Formula]

[Normal value]

α1 + (LR × m) + LS × (1×(2×n-1)+1) +{SL×(k＋1)} [ms] (∗4)

[Maximum value]

α1 + (LR × m) + LS × (2×(2×n-1)+1) +{SL×(k＋1)} [ms] (∗4)

α1: Request processing time of the personal computer
LR: Link refresh time
LS: Link scan time (refer to Appendix 3.1)
SL: Local station sequence program scan time
k: LS/SL (However, the decimal point is rounded up)
m : LS/LR (However, the decimal point is rounded up)
n: Expanded cyclic setting (n time setup)
Note that n=1 is used for a Ver.1 compatible slave station.

∗3: The above one is shown by the example of the remote device station (RX, RY), but it is also applicable for the remote device station (RWr, RWw).

∗4: When writing RY to the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

(4) Master station (CC-Link Ver.2 board) ↔ intelligent device station

The transmission delay time between the master station (CC-Link Ver.2 board) and the intelligent device station varies depending on the type of intelligent device station used.
Refer to the User's Manual for the intelligent device module to be used.

Notes

- When reading RX and RWr from the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.
- When writing RY and RWw to the CC-Link Ver.2 board with the md function, it is necessary to add the own station access processing time of the md function.

POINT

The own station access processing time by the md function varies depending on the performance of the personal computer, load status and other factors.

Appendix 3.3 Transient transmission processing time

This indicates the transient transmission processing time (the time required to execute an instruction and receive the processing result).

POINT

The own station access processing time by the md function varies depending on the performance of the personal computer, load status and other factors. The following shows an example of the processing time for a personal computer with Pentium II (233MHz).

Own station access processing time (personal computer with Pentium II (233MHz))

Access size / md function	2 bytes	512 bytes	1024 bytes
Batch read (mdReceive)	0.3ms	0.7ms	1.2ms
Batch write (mdSend)	0.3ms	0.4ms	0.5ms

(1) Master station (CC-Link Ver.2 board) ↔ local station (programmable controller)

(a) Master station (CC-Link Ver.2 board) → Local station (programmable controller)

The following formula indicates the time taken from instruction execution at the master station (CC-Link Ver.2 board) to receive processing result from the local station (programmable controller).

[Formula]

[Maximum value]

1) Read

LS × [BC + {(Read points + 16)/16}^{*1} × 1.067] + SL [ms]

LS: Link scan time (Refer to Appendix 3.1.)

BC: Constant

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BC	6	7	9	11	12

SL: Local station's sequence program scan time

*1: Round up decimals.

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2) Write

OT + LS × [BC + {(Write points + 16)/72}*1 × 1.067] + SL [ms]

OT: Data transmission time between the personal computer and the CC-Link Ver.2 board.

The processing time varies depending on the performance of the personal computer, load status, and other factors. The following table shows an example of the processing time for a personal computer with a Pentium II (233MHz).

md function \ Access size	2 bytes	512 bytes	1024 bytes
Batch read (mdReceive)	0.4ms	0.8ms	1.3ms
Batch write (mdSend)	0.4ms	0.5ms	0.6ms

LS: Link scan time (Refer to Appendix 3.1.)

BC: Constant

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BC	6	7	9	11	12

SL: Local station's sequence program scan time

*1: Round up decimals.

POINT

When performing a transient transmission using the md functions, the transient transmission is executed in several runs by dividing the number of request data into sizes inside the md functions that can be received by the opposite station. In addition, after the communication line is opened, the first md function performs extra transient transmission in order to obtain detailed information of the programmable controller.

(2) Master station (CC-Link Ver.2 board) ↔ intelligent device station

(a) Master station (CC-Link Ver.2 board) → Intelligent device station

The following formula indicates the time taken from instruction execution at the master station (CC-Link Ver.2 board) to receive processing result from the intelligent device station.

[Formula]

[Maximum value]

1) Read

OT + LS × [BC + {(Read points + 16)/16}*1 1 × 1.067] [ms]

OT: Data transmission time between the personal computer and the CC-Link Ver.2 board

The processing time varies depending on the performance of the personal computer, load status, and other factors. The following table shows an example of the processing time for a personal computer with a Pentium II (233MHz).

Access size / md function	2 bytes	512 bytes	1024 bytes
Batch read (mdReceive)	0.4ms	0.8ms	1.3ms
Batch write (mdSend)	0.4ms	0.5ms	0.6ms

LS: Link scan time (Refer to Appendix 3.1.)

BC: Constant

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BC	6	7	9	11	12

*1: Round up decimals.

2) Write

OT + LS × [BC + {(Write points + 16)/72} *1 1 × 1.13] [ms]

OT: Data transmission time between the personal computer and the CC-Link Ver.2 board

The processing time varies depending on the performance of the personal computer, load status, and other factors. The following table shows an example of the processing time for a personal computer with a Pentium II (233MHz).

Access size / md function	2 bytes	512 bytes	1024 bytes
Batch read (mdReceive)	0.4ms	0.8ms	1.3ms
Batch write (mdSend)	0.4ms	0.5ms	0.6ms

LS : Link scan time (Refer to Appendix 3.1.)

BC : Constant

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BC	6	7	9	11	12

*1: Round up decimals.

POINT

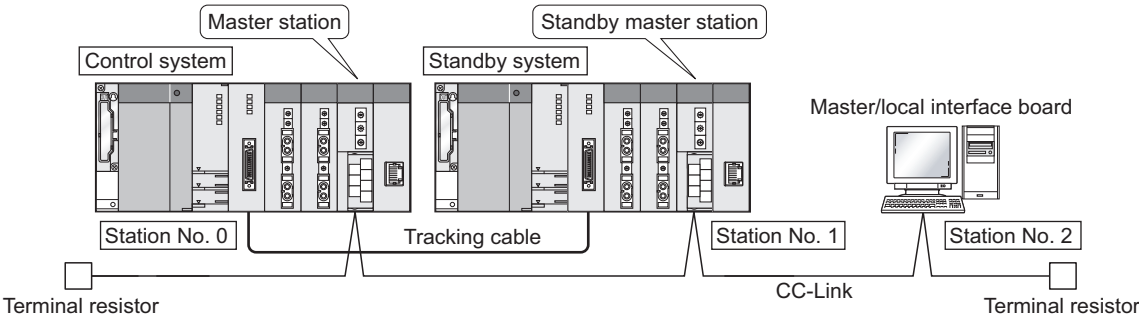
When performing a transient transmission using the md functions, the transient transmission is executed in several runs by dividing the number of request data into sizes inside the md functions that can be received by the opposite station. In addition, after the communication line is opened, the first md function performs extra transient transmission in order to obtain detailed information of the programmable controller.

Appendix 4 Communication with the Redundant CPU

This section explains communication with the Redundant CPU when the CC-Link Ver.2 board is used.

(1) Incorporation into redundant system

In a Redundant CPU system, be sure to set the CC-Link Ver.2 board to a local station.



(2) Access to the Redundant CPU

(a) Redundant CPU specify

To access the Redundant CPU, directly specify the station number of the CC-Link module mounted on the station of the target Redundant CPU.

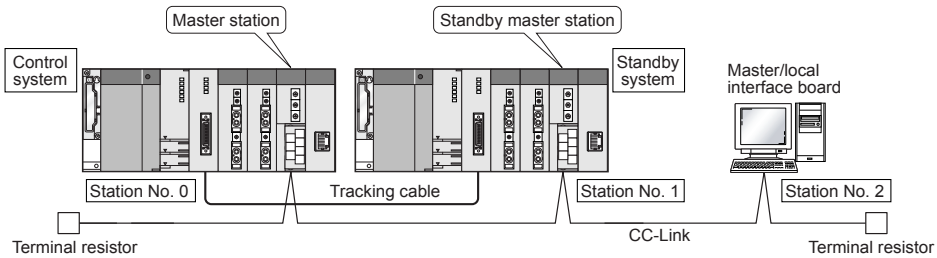
(b) Action to be taken at occurrence of system switching

After system switching, the Redundant CPU in the same system (control system or standby system) can also be accessed by directly specifying the station number that was specified before system switching. *1

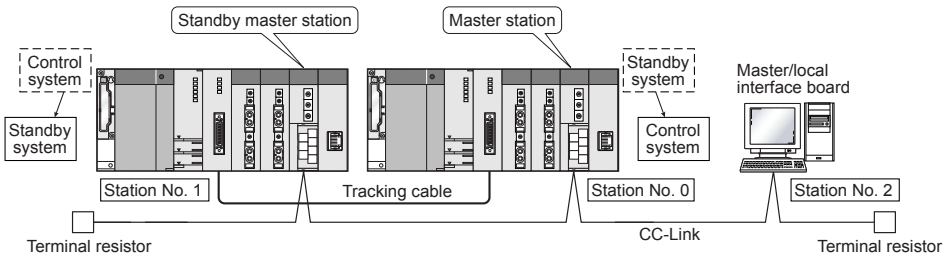
*1: When system switching occurs in the Redundant CPU system to be accessed, the station number of the CC-Link module mounted on the station of each Redundant CPU is also changed internally.

(Example) When the Redundant CPU in the control system is accessed

Before system switching



After system switching



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POINT

Create a program to monitor which system in the redundant CPU system is accessed from the CC-Link Ver.2 board.

SM 1515	Control system judgment flag	• Indicates the CPU module operation status • Remains ON/OFF even if the tracking cable is disconnected while the redundant system is running.
SM 1516	Standby system judgment flag	

	Control system	Standby system	At the time of TRK.CABLE ERR.(Error code: 6120) occurrence (System not determined.)
SM1515	ON	OFF	OFF
SM1516	OFF	ON	OFF

(3) Retry processing for error that will occur during system switching processing

Any of the following errors will occur when the MELSEC data link library is used to access the Redundant CPU during system switching processing.

Examples of errors that will occur in redundant CPU

- A system switching error (Error code 4248H)
- CPU starting error (Error code 4004H)
- Other system CPU module error (Error code 4245H)
- Access destination illegal error (Error code FFDFH)

Examples of errors that will occur in CC-Link Ver.2 board or module

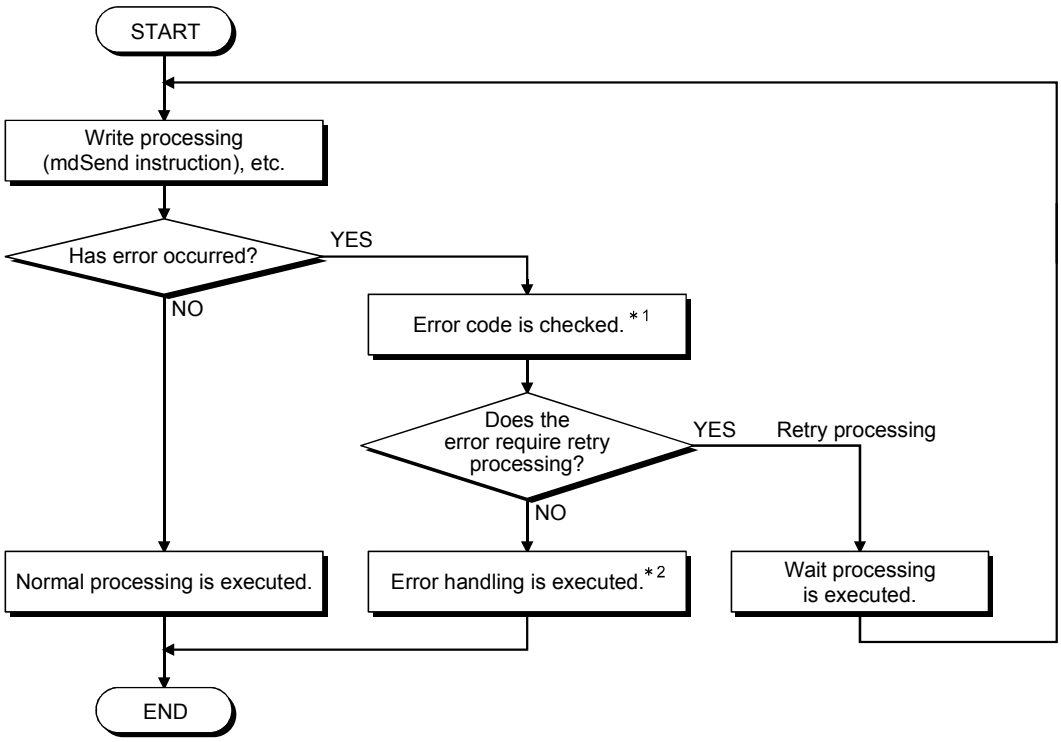
- Response timeout (Error code B778H)
- Corresponding station error during sending (Error code B201H)
- Transient target station error (Error code B205H)

When an error has occurred, confirm the error code, and create a user program for retry processing as necessary.

(a) The following indicates the functions that will result in error if executed during system switching.

	Functions that will result in error by system switching
MELSEC data link library	mdControl,mdDevRst,mdDevSet,mdRandR,mdRandW, mdReceive,mdSend,mdTypeRead

(b) The following example gives a flowchart for error occurrence at batch write.



∗1: Refer to the following manual for the details of and corrective action for the error code.

When a Redundant CPU error occurs

- "Error code returned to request source during communication with CPU module" in the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

When a CC-Link Ver.2 board error or module error occurs

- Section 15.3.5 in this manual
  "Error codes stored in the link special registers"

∗2: Perform retry processing as necessary according to the system specifications.

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Appendix 5 Comparisons with CC-Link Ver.1 Board and CC-Link Module

Differences between the CC-Link Ver.2 board and CC-Link Ver.1 board, and functional comparisons between the CC-Link Ver.2 board and CC-Link module are shown here.

Appendix 5.1 Differences from the CC-Link Ver.1 board

The following describes the main differences between the CC-Link Ver.2 board (Q80BD-J61BT11N, Q81BD-J61BT11) and the CC-Link Ver.1 board (A80BDE-J61BT11, A80BDE-J61BT13).
For details other than those shown below, refer to Chapter 3.

(1) Performance Specifications

			CC-Link Ver.2 board (Q80BD-J61BT11N, Q81BD-J61BT11)				CC-Link Ver.1 board (A80BDE-J61BT11, A80BDE-J61BT13)
Max. No. of I/O points	Remote I/O (RX,RY)		8192points				2048points
	Remote register (RWw)		2048points				256points
	Remote register (RWr)		2048points				256points
No. of link points par station	Expanded cyclic setting		1 time setup	2 time setup	4 time setup	8 time setup	
	Remote I/O (RX,RY)		32points	32points	64points	128points	32points
	Remote register (RWw)		4points	8points	16points	32points	4points
	Remote register (RWr)		4points	8points	16points	32points	4points
Number of link points par number of occupied station count	Occupies 1 station	Remote I/O (RX,RY)	8points	32points	64points	128points	32points
		Remote register RWw)	4points	8points	16points	32points	4points
		Remote register (RWr)	4points	8points	16points	32points	4points
	Occupies 2 stations	Remote I/O (RX,RY)	64points	96points	192points	384points	64points
		Remote register RWw)	8points	16points	32points	64points	8points
		Remote register (RWr)	8points	16points	32points	64points	8points
	Occupies 3 stations	Remote I/O (RX,RY)	96points	160points	320points	640points	96points
		Remote register RWw)	12points	24points	48points	96points	12points
		Remote register (RWr)	12points	24points	48points	96points	12points
	Occupies 4 stations	Remote I/O (RX,RY)	128points	224points	448points	896points	128points
		Remote register RWw)	16points	32points	64points	128points	16points
		Remote register (RWr)	16points	32points	64points	128points	16points
Transmission delay time	Output transmission delay time		LS × 4 + Output processing time	LS × 8 + Output processing time	LS × 16 + Output processing time	LS × 32 + Output processing time	LS × 3 + Output processing time
	Input transmission delay time		LS × 4 + Input processing time	LS × 8 + Input processing time	LS × 16 + Input processing time	LS × 32 + Input processing time	LS × 3 + Input processing time

(2) CC-Link Board Functions

	CC-Link Ver.2 board (Q80BD-J61BT11N, Q81BD-J61BT11)	CC-Link Ver.1 board (A80BDE-J61BT11, A80BDE-J61BT13)	Reference section
Cyclic points increase function	Available	Unavailable	1.2, 4.4.7
Remote I/O station points setting	Available	Unavailable	1.2, 4.4.6
0-points Setting for the reserved station	Available	Unavailable	4.1
Parameter Saving function	Available	Unavailable	8.2.4
Parameter Reading function	Available	Unavailable	
Parameter Verification function	Available	Unavailable	
SB/SW save function	Available	Unavailable	8.2.2

(3) MELSEC Data Link Library

Item			CC-Link Ver.2 Board (Q80BD-J61BT11N, Q81BD-J61BT11)			CC-Link Ver.1 Board (A80BDE-J61BT11, A80BDE-J61BT13)
	Offset value	Information				
mdBdVerRead Version information to be read by functions	00H	Password	'S', 'G' fixed			
	01H	Checksum	The sum of 02H to 0FH			
	02H	S/W version	'A' to 'ZZ'			
	03H to 05H	Date	Date (year, month, day) (Exp.) 2005 April 1st: '0' '5' '0' '4' '0' '1'			
	06H, 07H	Reservation area	0000H fixed			
	08H to 0FH	S/W format name	'QJ61BT11N'			'J61BT13', 'J61BT11'
	10H to 17H	H/W format name	'Q80BD-J61BT11N'			'A80BD-J61BT13', 'A80BD-J61BT11'
	18H	2port memory possession size	0200H (512k bytes)			4000H (16k bytes)
	19H	2port attribute	0080H fixed			
	1AH	Useable offset	0000H fixed			
	1BH to 1FH	Machine classification	1BH	(L)	Function version	'A80BD'
				(H)	CC-Link version (higher)	
			1CH	(L)	CC-Link version (lower)	
				(H)	0 fixed	
			1DH to 1FH		0 fixed	

(4) Communication with Intelligent device station (AJ65BT-R2)

Item	CC-Link Ver.2 Board (Q80BD-J61BT11N, Q81BD-J61BT11)	CC-Link Ver.1Board (A80BDE-J61BT11, A80BDE-J61BT13)
Communication function using the buffer, on the host station (CC-Link Ver.1 Board/CC-Link Ver.2 Board), that can send/receive data	Not available	Available

Appendix 5.2 Functional comparisons with CC-Link module

The main functional comparisons between the CC-Link Ver.2 board (Q80BD-J61BT11N) and CC-Link Module (QJ61BT11N, Q81BD-J61BT11) are shown here. For details of the functions, refer to Chapter 4.

Function			Q80BD-J61BT11N, Q81BD-J61BT11	QJ61BT11N
Cyclic transmission function	Communication in Remote net mode	Compatibility with Remote net ver.2 mode	○＊1	○
		Compatibility with Remote net additional mode	○＊1	○
		Compatibility with Remote net ver.1 mode	○	○
	Communication in Remote I/O net mode		×	○
	Block data assurance per station setting	Function to prevent link data separation per station ＊2	○	○
Transient transmission function	Other station access by GX Developer		○	○
	Other station access by dedicated instructions		×	○
	Other station access by MELSEC data link library		○	×
Standby master function	Standby master function		○	○
	Master station duplex function		×	○
Reserved station function			○	○
Error invalid station setting function			○	○
RAS function	Hardware Test function		○	○
	Automatic return function		○	○
	Slave station cut-off function		○	○
	Temporary error invalid station setting function		×	○
	Slave station refresh/forced clear setting function for programmable controller CPU STOP		×	○
Improved usability	Automatic CC-Link startup		×	○
	Remote device station initialization procedure registration function		×	○
	Event issue function		×	○
	Multiple CPU system support		○	○
	Remote I/O station points setting		○＊1	○
	0-point setting to the reserved station		○＊1	○

○: Supported ×: Not supported

＊1: This function is newly provided to the CC-Link Ver.2 board in addition to the CC-Link Ver.1 board functions.

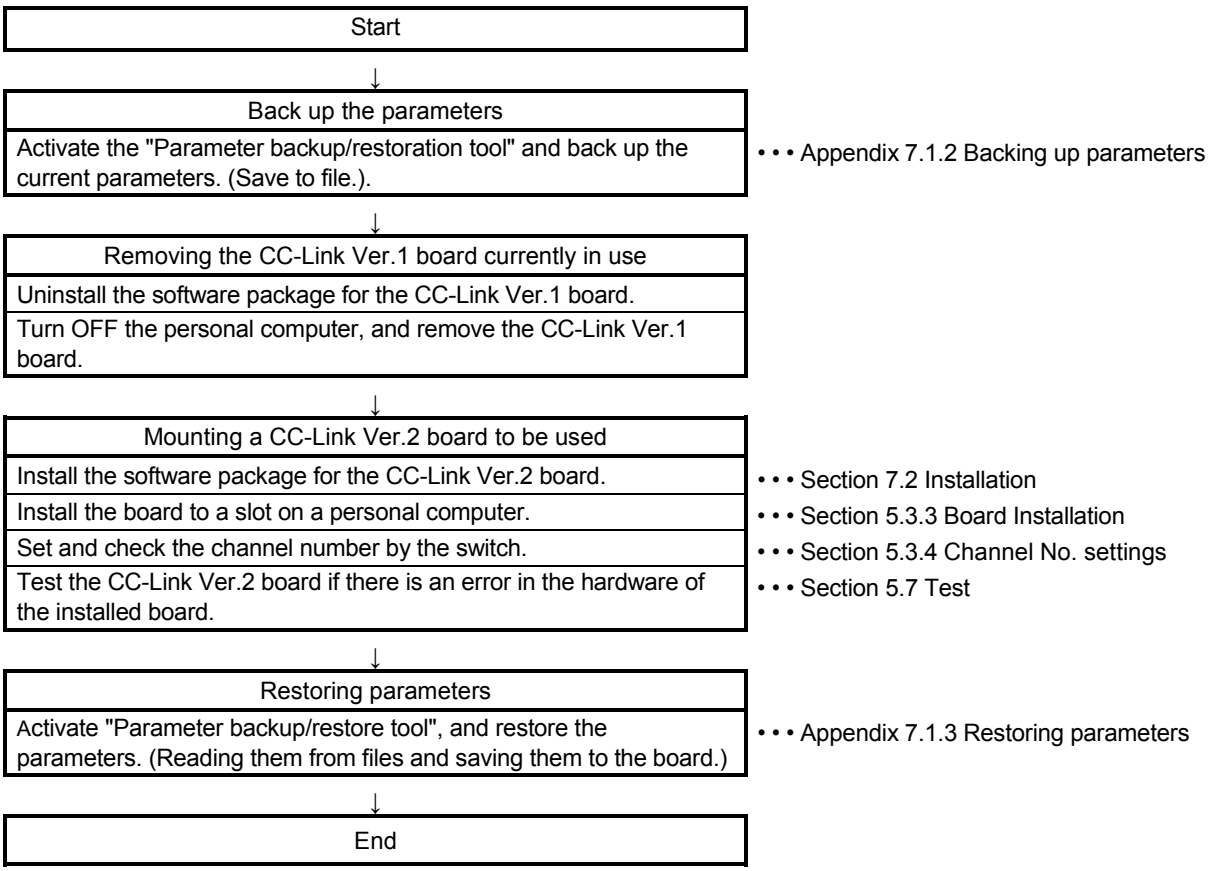
＊2: Separation is a condition that link data with double words (32 bits), such as the current value of the positioning module, are separated to new data and old data in units of one word (16 bits) due to the refresh timing of cyclic transmission.

Appendix 6 Replacing the CC-Link Board

This appendix describes the CC-Link board replacement procedure and precautions.

Appendix 6.1 Replacing a CC-Link Ver.1 board with a CC-Link Ver.2 board

This section describes how to replace the CC-Link Ver.1 board currently mounted to the PC with a CC-Link Ver.2 board and precautions to be observed.


Start
Back up the parameters
Activate the "Parameter backup/restoration tool" and back up the current parameters. (Save to file.).
• • • Appendix 7.1.2 Backing up parameters
Removing the CC-Link Ver.1 board currently in use
Uninstall the software package for the CC-Link Ver.1 board.
Turn OFF the personal computer, and remove the CC-Link Ver.1 board.
Mounting a CC-Link Ver.2 board to be used
Install the software package for the CC-Link Ver.2 board.
• • • Section 7.2 Installation
Install the board to a slot on a personal computer.
• • • Section 5.3.3 Board Installation
Set and check the channel number by the switch.
• • • Section 5.3.4 Channel No. settings
Test the CC-Link Ver.2 board if there is an error in the hardware of the installed board.
• • • Section 5.7 Test
Restoring parameters
Activate "Parameter backup/restore tool", and restore the parameters. (Reading them from files and saving them to the board.)
• • • Appendix 7.1.3 Restoring parameters
End

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Appendix 6.2 Replacing a CC-Link Ver.2 board with a CC-Link Ver.1 board, or a CC-Link board with another of the same version

The following describes how to replace a CC-Link Ver.2 board with a CC-Link Ver.1 board, or a CC-Link board with another of the same version.

(1) When replacing a CC-Link Ver.2 board with a CC-Link Ver.1 board, change the terms shown in Appendix 6 as follows:
- Changing a CC-Link Ver.1 board to a CC-Link Ver.2 board.
- Changing a CC-Link Ver.2 board to a CC-Link Ver.1 board.

(2) When replacing a CC-Link board with another of the same version, the following steps shown in Appendix 6 are not required.
- Backup and restoration of CC-Link board parameters
- Uninstallation and reinstallation of software packages

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Appendix 6.3 Precautions

This section provides the precautions for CC-Link board replacement.

(1) When multiple CC-Link boards are mounted on the same PC, all the boards must be of the same version.
(Example) When replacing a CC-Link Ver.1 board with a CC-Link Ver.2 board
Replace all CC-Link Ver.1 boards currently mounted on the PC with CC-Link Ver.2 boards.

(2) To re-use the parameters, back up them before uninstall the CC-Link Utility.
(Example) When replacing a CC-Link Ver.1 board with a CC-Link Ver.2 board
Back up the parameters of the CC-Link Ver.1 board, and then uninstall the CC-Link Ver.1 Utility.

(3) Install only the software package of the same version as the CC-Link board currently mounted. Uninstall the software packages (utility and driver) which are not supported by the installed CC-Link board.
(Example) When a CC-Link Ver.2 board is mounted
Uninstall the CC-Link Ver.1 board software package, and then install the CC-Link Ver.2 board software package.

(Compatibility between CC-Link boards and software packages)*1

	CC-Link Ver.1 Board Software Package	CC-Link Ver.2 Board Software Package
CC-Link Ver.1 board	○	×
CC-Link Ver.2 board	×	○

○: Compatible ×: Not compatible

*1: The following conditions are found when the installed software package is not compatible with the CC-Link board currently mounted.

[Conditions]
- A parameter error occurs when the CC-Link system is started up.
- The information of the CC-Link Ver.2 board is displayed on the CC-Link Ver.1 Utility.
- A parameter read error occurs when the CC-Link Ver.1 Utility is started up.
- The CC-Link Ver.1 Utility does not run correctly.
(An error such as a display error or an application error occurs.)
- The message, "An attempt to link a device name has failed." is displayed in the event viewer.

Appendix 7 About "Parameter backup/restore tool"

This section describes the "Parameter backup/restore tool" that is used for re-using existing parameters.

The "Parameter backup/restore tool" is a dedicated tool for backing up and restoring CC-Link board parameters, and is stored in the SW1DNC-CCBD2-B CD-ROM.

(Backup)
Stores parameters of the CC-Link board that is currently mounted to the PC into files.
(Restore)
Reads the backed-up parameters and stores them into a CC-Link board.

By using this dedicated tool, the user can re-use existing parameters without being aware of the version of the CC-Link board.

Appendix 7.1 Operation procedure

The following explains the operations of "Parameter backup/restore tool."

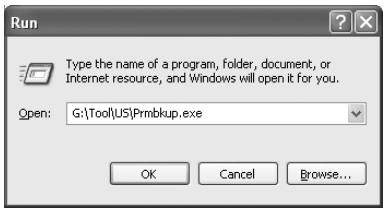
Appendix 7.1.1 Starting and exiting the tool

(1) Starting the tool

The following describes how to start "Parameter backup/restore tool".

(a) Insert SW1DNC-CCBD2-B into the CD-ROM drive.

(b) Click [Start] - [Run].



(c) Click the Browse button in the "Run" dialog box and select the Parameter backup/restore tool (PrmBkup.exe*1).

*1: "PrmBkup.exe" is stored in the following folder:
<CD-ROM drive>-<Tool>-<US>

(d) Check the displayed path, then click the OK button.

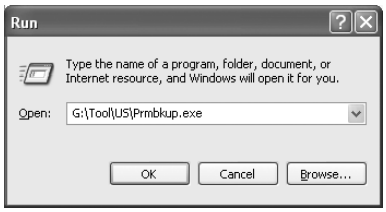
(e) The "Parameter backup/restore tool" dialog box is displayed.

(2) Exiting the tool

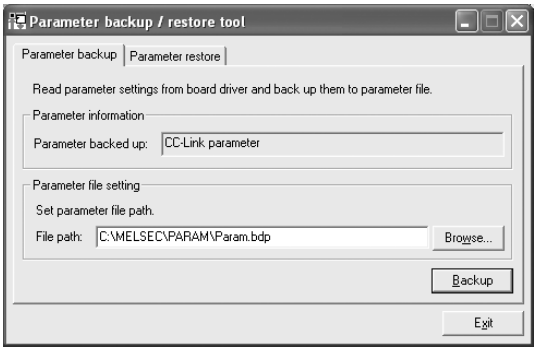
To exit the "Parameter backup/restoration tool," click [Close(C)] in the system menu, the X button at the top right of the dialog box, or END button at the bottom of the screen.

Appendix 7.1.2 Backing up parameters

The following describes the procedure for backing up parameters.

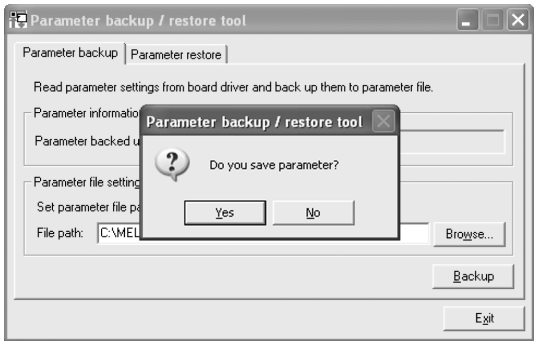


↓



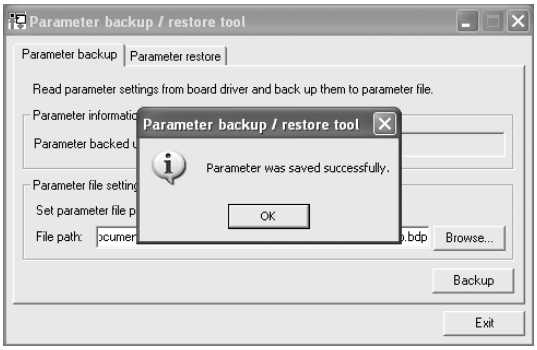
(1) Activate the "Parameter backup/restore tool." (Refer to Appendix 7.)

↓



(2) Select the <<Parameter backup>> in the "Parameter backup/restore tool" dialog box.
Enter the destination where the parameters are to be backed up in the "Parameter file setting" field.
You can also specify the backup destination in the "Open File" dialog box by clicking the Browse button.

↓



(3) After specifying the backup destination, click the Backup button. The confirmation dialog box is displayed.
Click the Yes button. The parameters are backed up to the specified file.

↓

(4) When the backup ends successfully, the dialog box on the left is displayed.
Click the OK button to end the backup.

↓

(End)

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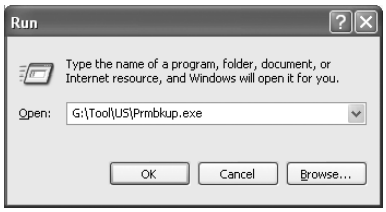
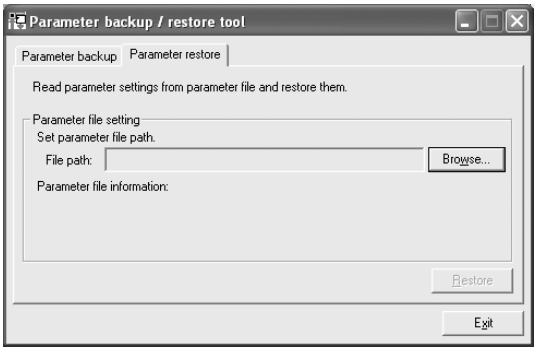
Appendix 7.1.3 Restoring parameters

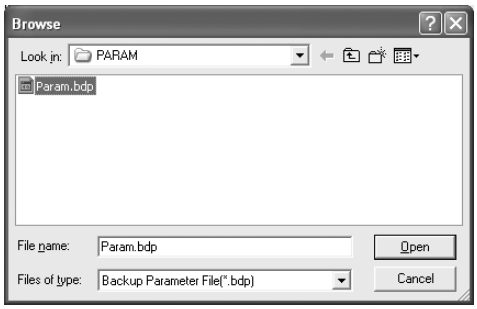
The following describes the procedure for restoring parameters.



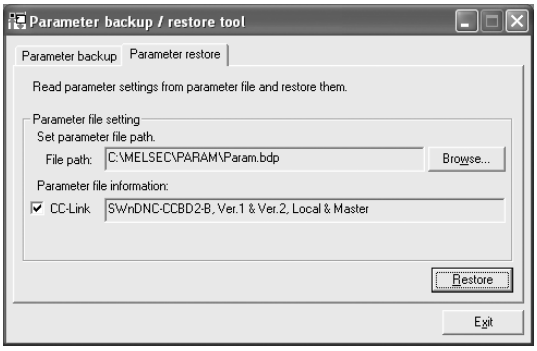
↓



↓



↓



↓

(To the next page)

(1) Activate the "Parameter backup/restore tool." (Refer to Appendix 7.)

(2) Select the <<Parameter restore>> in the "Parameter backup/restore tool" dialog box. (Refer to Appendix 3.3.2.)
Click the Browse button in the "Parameter file setting" field. The "Browse" dialog box is displayed.

(3) Select the parameter file to be restored, and click the Open button.

(4) The information of the selected file is displayed in the "Parameter file information" field under the "Parameter file setting".
Click the Restore button. The confirmation dialog box is displayed.
Click the Yes button to restore the parameters.

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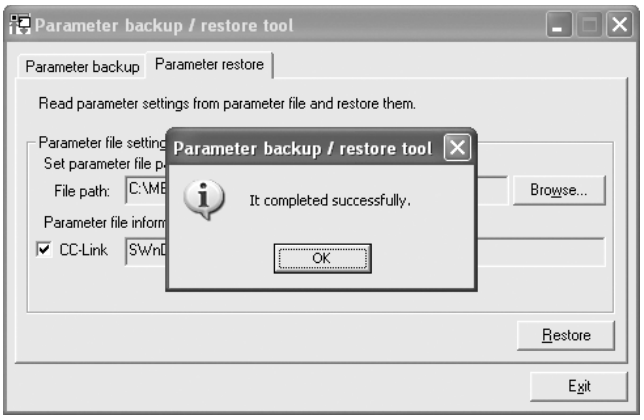
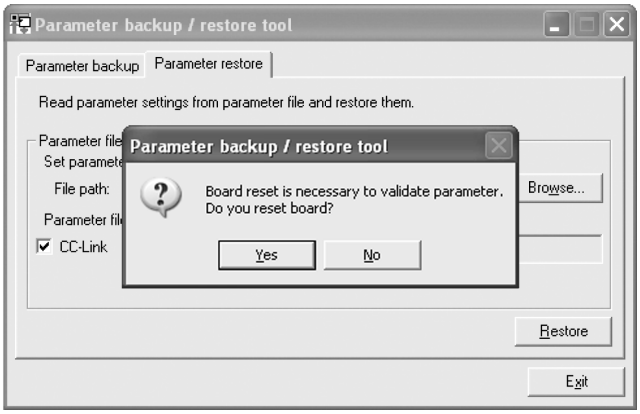
(From the previous page)

↓



↓



↓

(End)

(5) When the restoration ends successfully, the dialog box on the left is displayed.
Click the OK button to end the restoration.

(6) The CC-Link board reset request is displayed.
To make restored parameters effective, click the Yes button.

The CC-Link board is reset.

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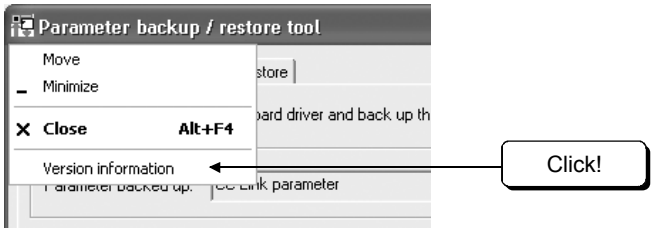
Appendix 7.1.4 How to check the version

The following shows how to check the version of the "Parameter backup/restore tool."

(1) Click the icon ( ) on the title bar of the "Parameter backup/restore tool" screen.

(2) Click "Version information" in the system menu.



(3) The version of the "Parameter backup/restore tool" is displayed.

Parameter backup / restore tool
Parameter backup / restore tool Version 1.00
OK
Copyright(C) 2005 MITSUBISHI ELECTRIC CORPORATION ALL RIGHTS RESERVED

Appendix 7.2 Precautions when using "Parameter backup/restoration tool"

The following are the precautions for using the "Parameter backup/restoration tool."

(1) Precautions when activating "Parameter backup/restoration tool"

Back up or restore parameters with the CC-Link Utility already installed.

(2) Restrictions on restoration

The following table shows whether backed-up parameters can be restored or not for each case.

○: Can be restored ×: Cannot be restored

Backup target	Mode	Restoration target	
		CC-Link Ver.1 board (SWnDNF-CCLINK-B)	CC-Link Ver.2 board (SW1DNC-CCBD2-B)
CC-Link Ver.1 board (SWnDNF-CCLINK-B)	Ver.1 mode	○	○
CC-Link Ver.2 board (SW1DNC-CCBD2-B)	Ver.1 mode	○*1	○*1
	Ver.2 mode	×	○*1
	Additional mode	×	○

*1: The parameter added to the SW1DNC-CCBD2-B Version 1.17T or later will be considered as default value.

(3) File name and file path entered when backing up parameters

The following table shows the maximum number of characters that can be entered and the characters not to be used when entering file names and file paths.

File Name Length/Path Length	Illegal Characters
255 characters	* : < > ? | "

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Appendix 8 Setting Checklists

Some kinds of sheets are provided in this section for setting the parameters required for the CC-Link system configuration.
Make photocopies and use them as needed.

Appendix 8.1 Parameter setting checklist

Parameter Setting Check List

Setting item		Setting range/Item	
Channel No.		Channel No. 81 / Channel No.82 Channel No. 83 / Channel No.84	
Sta. No./Type		No.	Master station / Local station / Standby master station
Transmission rate		156kbps / 625kbps / 2.5Mbps / 5Mbps / 10Mbps	
Mode		Remote net [Ver.1 mode] / Remote net [Ver.2 mode] Remote net [Additional mode] / Off line	
Operation settings	Expanded cyclic	Single / Double / Quadruple / Octuple	
	Occupied Sta.	Occupies 1 station / Occupies 2 stations Occupies 3 stations / Occupies 4 stations	
	Input for Err Sta.	Hold / Clear	
Other Settings	Retry count	Times	
	Automatic reconnection station count	Modules	
	Standby master station No.	No.	
	Delay information setting	× 50 micro sec	
	Driver WDT Monitoring Time	No setting / × 8 ms	
	Block data assurance per station	Disable / Enable	
	Link refresh cycle	No setting / ms	
Station information settings	All connect count	Modules	

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Appendix 8.2 Station information setting checklist

Station information setting checklist

Sta. No.	Station type	Expanded cyclic	Occupied Sta.	Remote station points	Reserve/invalid station select	Intelligent buffer select (word)		
						Send	Receive	Automatic
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								

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Sta. No.	Station type	Expanded cyclic	Occupied Sta.	Remote station points	Reserve/invalid station select	Intelligent buffer select (word)		
						Send	Receive	Automatic
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
61								
62								
63								
64								

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Appendix 8.3 Device assignment checklist

Device assignment checklist

No.	RX	RY	RWw	RWr
1	RX00 to RX1F→	RY00 to RY1F→	RWw0 to RWw3→	RWr0 to RWr3→
2	RX20 to RX3F→	RY20 to RY3F→	RWw4 to RWw7→	RWr4 to RWr7→
3	RX40 to RX5F→	RY40 to RY5F→	RWw8 to RWwB→	RWr8 to RWrB→
4	RX60 to RX7F→	RY60 to RY7F→	RWwC to RWwF→	RWrC to RWrF→
5	RX80 to RX9F→	RY80 to RY9F→	RWw10 to RWw13→	RWr10 to RWr13→
6	RXA0 to RXBF→	RYA0 to RYBF→	RWw14 to RWw17→	RWr14 to RWr17→
7	RXC0 to RXDF→	RYC0 to RYDF→	RWw18 to RWw1B→	RWr18 to RWr1B→
8	RXE0 to RXFF→	RYE0 to RYFF→	RWw1C to RWw1F→	RWr1C to RWr1F→
9	RX100 to RX11F→	RY100 to RY11F→	RWw20 to RWw23→	RWr20 to RWr23→
10	RX120 to RX13F→	RY120 to RY13F→	RWw24 to RWw27→	RWr24 to RWr27→
11	RX140 to RX15F→	RY140 to RY15F→	RWw28 to RWw2B→	RWr28 to RWr2B→
12	RX160 to RX17F→	RY160 to RY17F→	RWw2C to RWw2F→	RWr2C to RWr2F→
13	RX180 to RX19F→	RY180 to RY19F→	RWw30 to RWw33→	RWr30 to RWr33→
14	RX1A0 to RX1BF→	RY1A0 to RY1BF→	RWw34 to RWw37→	RWr34 to RWr37→
15	RX1C0 to RX1DF→	RY1C0 to RY1DF→	RWw38 to RWw3B→	RWr38 to RWr3B→
16	RX1E0 to RX1FF→	RY1E0 to RY1FF→	RWw3C to RWw3F→	RWr3C to RWr3F→
17	RX200 to RX21F→	RY200 to RY21F→	RWw40 to RWw43→	RWr40 to RWr43→
18	RX220 to RX23F→	RY220 to RY23F→	RWw44 to RWw47→	RWr44 to RWr47→
19	RX240 to RX25F→	RY240 to RY25F→	RWw48 to RWw4B→	RWr48 to RWr4B→
20	RX260 to RX27F→	RY260 to RY27F→	RWw4C to RWw4F→	RWr4C to RWr4F→
21	RX280 to RX29F→	RY280 to RY29F→	RWw50 to RWw53→	RWr50 to RWr53→
22	RX2A0 to RX2BF→	RY2A0 to RY2BF→	RWw54 to RWw57→	RWr54 to RWr57→
23	RX2C0 to RX2DF→	RY2C0 to RY2DF→	RWw58 to RWw5B→	RWr58 to RWr5B→
24	RX2E0 to RX2FF→	RY2E0 to RY2FF→	RWw5C to RWw5F→	RWr5C to RWr5F→
25	RX300 to RX31F→	RY300 to RY31F→	RWw60 to RWw63→	RWr60 to RWr63→
26	RX320 to RX33F→	RY320 to RY33F→	RWw64 to RWw67→	RWr64 to RWr67→
27	RX340 to RX35F→	RY340 to RY35F→	RWw68 to RWw6B→	RWr68 to RWr6B→
28	RX360 to RX37F→	RY360 to RY37F→	RWw6C to RWw6F→	RWr6C to RWr6F→
29	RX380 to RX39F→	RY380 to RY39F→	RWw70 to RWw73→	RWr70 to RWr73→
30	RX3A0 to RX3BF→	RY3A0 to RY3BF→	RWw74 to RWw77→	RWr74 to RWr77→
31	RX3C0 to RX3DF→	RY3C0 to RY3DF→	RWw78 to RWw7B→	RWr78 to RWr7B→
32	RX3E0 to RX3FF→	RY3E0 to RY3FF→	RWw7C to RWw7F→	RWr7C to RWr7F→
33	RX400 to RX41F→	RY400 to RY41F→	RWw80 to RWw83→	RWr80 to RWr83→
34	RX420 to RX43F→	RY420 to RY43F→	RWw84 to RWw87→	RWr84 to RWr87→
35	RX440 to RX45F→	RY440 to RY45F→	RWw88 to RWw8B→	RWr88 to RWr8B→
36	RX460 to RX47F→	RY460 to RY47F→	RWw8C to RWw8F→	RWr8C to RWr8F→
37	RX480 to RX49F→	RY480 to RY49F→	RWw90 to RWw93→	RWr90 to RWr93→
38	RX4A0 to RX4BF→	RY4A0 to RY4BF→	RWw94 to RWw97→	RWr94 to RWr97→
39	RX4C0 to RX4DF→	RY4C0 to RY4DF→	RWw98 to RWw9B→	RWr98 to RWr9B→
40	RX4E0 to RX4FF→	RY4E0 to RY4FF→	RWw9C to RWw9F→	RWr9C to RWr9F→
41	RX500 to RX51F→	RY500 to RY51F→	RWwA0 to RWwA3→	RWrA0 to RWrA3→
42	RX520 to RX53F→	RY520 to RY53F→	RWwA4 to RWwA7→	RWrA4 to RWrA7→
43	RX540 to RX55F→	RY540 to RY55F→	RWwA8 to RWwAB→	RWrA8 to RWrAB→
44	RX560 to RX57F→	RY560 to RY57F→	RWwAC to RWwAF→	RWrAC to RWrAF→

No.	RX	RY	RWw	RWr
45	RX580 to RX59F→	RY580 to RY59F→	RWwB0 to RWwB3→	RWrB0 to RWrB3→
46	RX5A0 to RX5BF→	RY5A0 to RY5BF→	RWwB4 to RWwB7→	RWrB4 to RWrB7→
47	RX5C0 to RX5DF→	RY5C0 to RY5DF→	RWwB8 to RWwBB→	RWrB8 to RWrBB→
48	RX5E0 to RX5FF→	RY5E0 to RY5FF→	RWwBC to RWwBF→	RWrBC to RWrBF→
49	RX600 to RX61F→	RY600 to RY61F→	RWwC0 to RWwC3→	RWrC0 to RWrC3→
50	RX620 to RX63F→	RY620 to RY63F→	RWwC4 to RWwC7→	RWrC4 to RWrC7→
51	RX640 to RX65F→	RY640 to RY65F→	RWwC8 to RWwCB→	RWrC8 to RWrCB→
52	RX660 to RX67F→	RY660 to RY67F→	RWwCC to RWwCF→	RWrCC to RWrCF→
53	RX680 to RX69F→	RY680 to RY69F→	RWwD0 to RWwD3→	RWrD0 to RWrD3→
54	RX6A0 to RX6BF→	RY6A0 to RY6BF→	RWwD4 to RWwD7→	RWrD4 to RWrD7→
55	RX6C0 to RX6DF→	RY6C0 to RY6DF→	RWwD8 to RWwDB→	RWrD8 to RWrDB→
56	RX6E0 to RX6FF→	RY6E0 to RY6FF→	RWwDC to RWwDF→	RWrDC to RWrDF→
57	RX700 to RX71F→	RY700 to RY71F→	RWwE0 to RWwE3→	RWrE0 to RWrE3→
58	RX720 to RX73F→	RY720 to RY73F→	RWwE4 to RWwE7→	RWrE4 to RWrE7→
59	RX740 to RX75F→	RY740 to RY75F→	RWwE8 to RWwEB→	RWrE8 to RWrEB→
60	RX760 to RX77F→	RY760 to RY77F→	RWwEC to RWwEF→	RWrEC to RWrEF→
61	RX780 to RX79F→	RY780 to RY79F→	RWwF0 to RWwF3→	RWrF0 to RWrF3→
62	RX7A0 to RX7BF→	RY7A0 to RY7BF→	RWwF4 to RWwF7→	RWrF4 to RWrF7→
63	RX7C0 to RX7DF→	RY7C0 to RY7DF→	RWwF8 to RWwFB→	RWrF8 to RWrFB→
64	RX7E0 to RX7FF→	RY7E0 to RY7FF→	RWwFC to RWwFF→	RWrFC to RWrFF→

Appendix 9 Combinations with Existing Software

This section describes the combinations of boards with existing software.
There is no restriction when using CC-Link Ver.2 board with other MELSEC interface boards or MELSOFT products on the same personal computer. For the restrictions of the applicable operating environment and applicable access target, refer to the manual of each product.

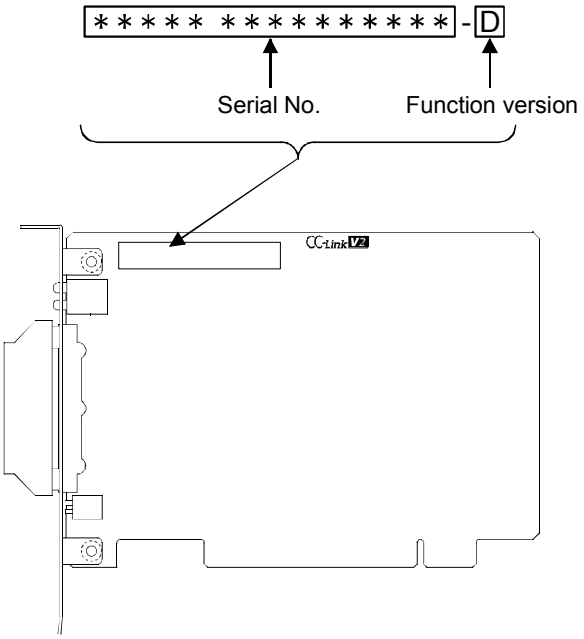
Appendix 10 Checking Serial Number and Function Version

This section explains how to check serial number, the function version and ROM version of the CC-Link Ver.2 board and the SW1DNC-CCBD2-B version.

(1) Checking serial number, function version, and ROM version of the CC-Link Ver.2 board

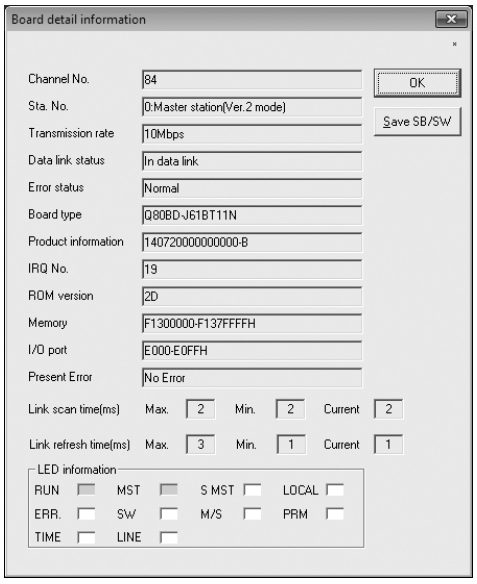
(a) Checking serial number and function version

The function version of the CC-Link Ver.2 board can be checked at "Serial" section as shown below.



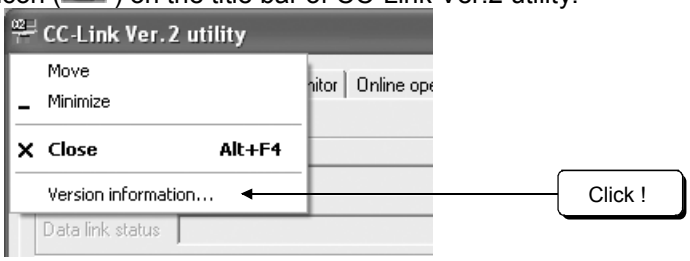
(b) Checking ROM version

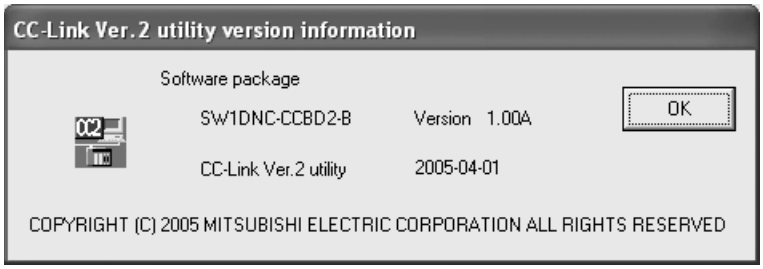
The ROM version of the CC-Link Ver.2 board is shown on "Board detail information" screen in the CC-Link Ver.2 utility.



(2) Checking the SW1DNC-CCBD2-B version

Select "Version information" from the system menu displayed by clicking on the icon ( ) on the title bar of CC-Link Ver.2 utility.





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Appendix 11 CC-Link Version

There are two types of CC-Link version, i.e., Ver.1 and Ver.2.

(1) Definition of Ver.1.00 and Ver.1.10

A product with a cable length of 20cm or longer between stations, which has been achieved by improving the restriction on the conventional cable distance between the stations, is defined as Ver. 1.10.
Whereas, the conventional product is defined as Ver.1.00.
For the maximum total cable length for the Ver. 1.10 products, refer to Section 3.2.3.
The conditions requiring the cable length to be 20cm or longer between stations are as follows:

1) All the stations comprising a CC-Link system must be of Ver.1.10.
2) All the data link cables must be Ver. 1.10 compatible CC-Link dedicated cables.

POINT

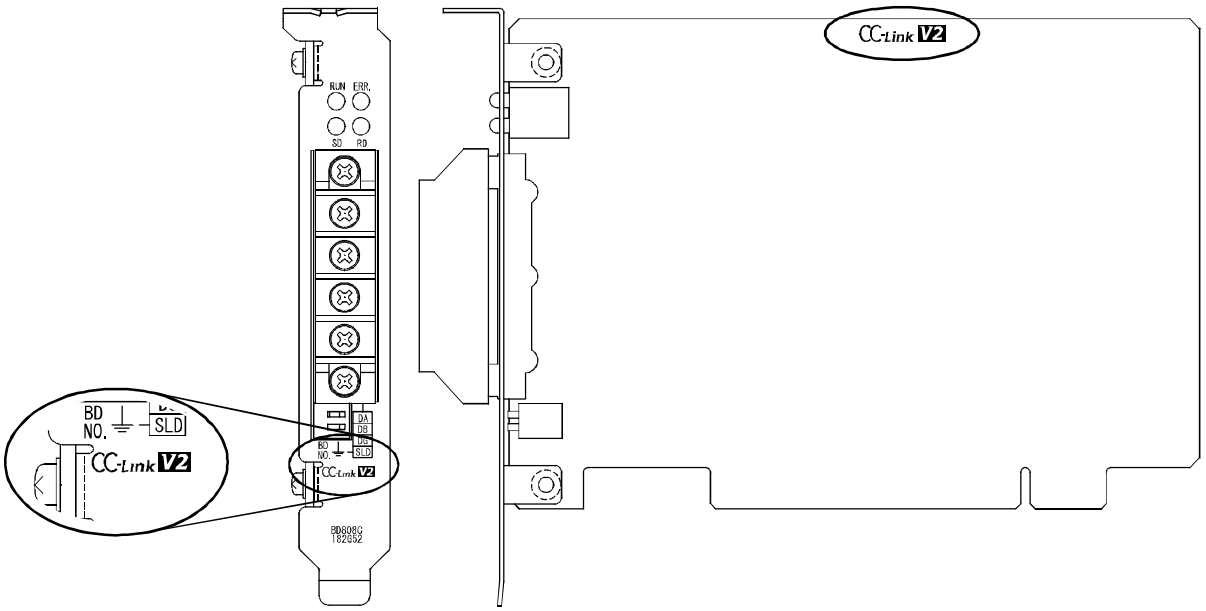
If stations of Ver.1.00 and Ver.1.10 are mixed in a system, the maximum total cable length and the cable length between stations will be as specified by Ver.1.00.
For the maximum total cable length and the cable length between stations for the Ver.1.00 products, refer to Section 3.2.2.

(2) Definition of Ver.2

The CC-Link Ver.2 board is defined as the Q80BD-J61BT11N /Q81BD-J61BT11 type CC-Link system master/local interface board supporting the extended cyclic points.

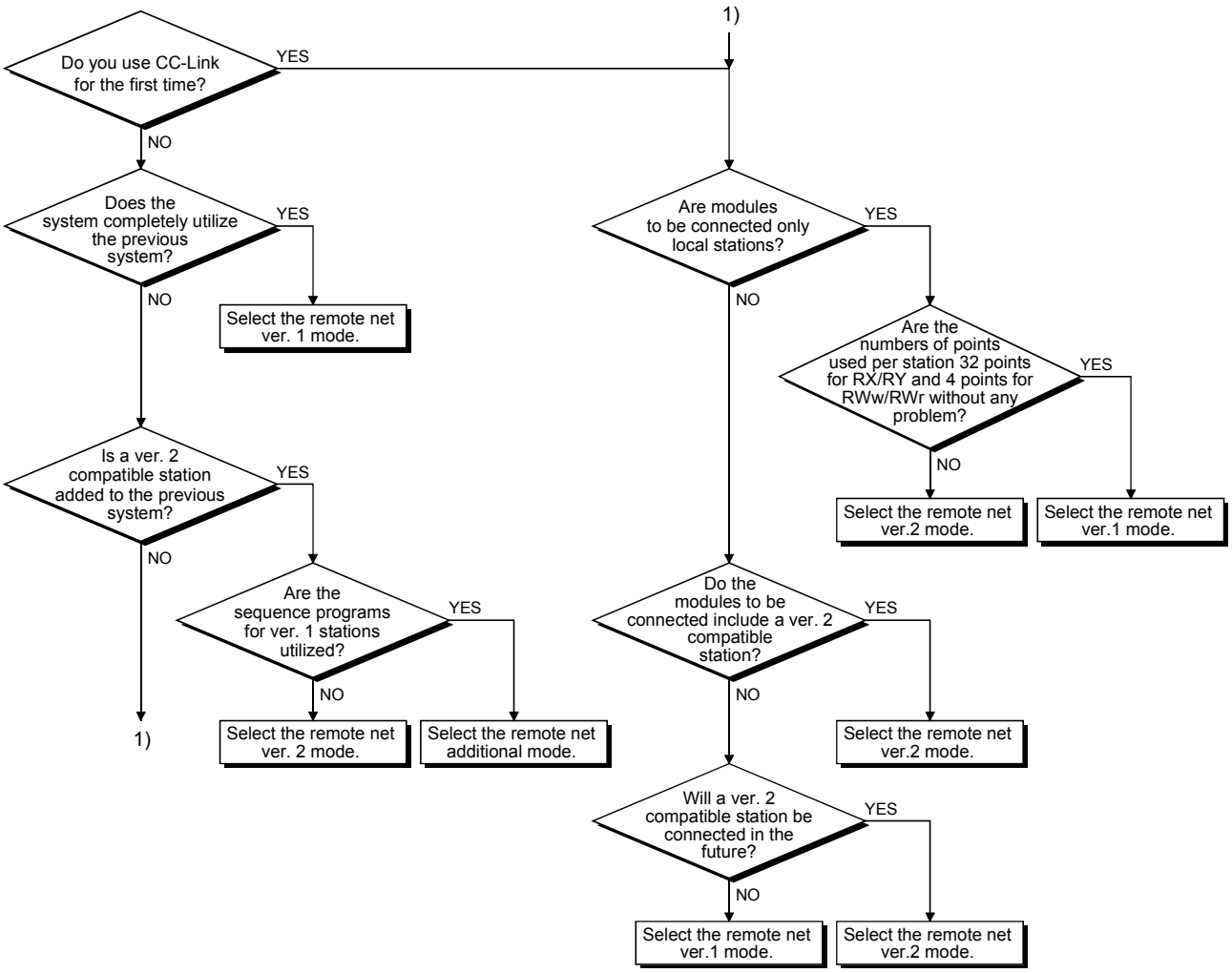
(3) How to check the version

The following logo is not shown on the Ver.1.00 compatible CC-Link board.
On the side of the Ver.1.10 compatible CC-Link board, the "CC-Link" logo is marked.
The Ver.2 compatible CC-Link board has "CC-Link V2" logos in the positions shown below.



Appendix 12 Mode Selection Method

Three different modes are available for CC-Link system to be applicable to various systems.
The following flowchart explains the points of mode selection.


Do you use CC-Link for the first time?
YES
NO
Does the system completely utilize the previous system?
YES
Select the remote net ver. 1 mode.
NO
Is a ver. 2 compatible station added to the previous system?
YES
Are the sequence programs for ver. 1 stations utilized?
YES
Select the remote net additional mode.
NO
Select the remote net ver. 2 mode.
NO
1)
1)
Are modules to be connected only local stations?
YES
Are the numbers of points used per station 32 points for RX/RY and 4 points for RWw/RWr without any problem?
YES
Select the remote net ver.1 mode.
NO
Select the remote net ver.2 mode.
NO
Do the modules to be connected include a ver. 2 compatible station?
YES
Select the remote net ver.2 mode.
NO
Will a ver. 2 compatible station be connected in the future?
YES
Select the remote net ver.2 mode.
NO
Select the remote net ver.1 mode.

Appendix 13 New and Improved Functions

Appendix 13.1 Change of hardware function

There is no new and improved functions related to the hardware version.

Appendix 13.2 Update of software package

For details of the update version software and the functions which are added or changed, please consult your local Mitsubishi representative.

POINT
For the precautions when installing the software package, refer to Section 7.1.

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Appendix 14 Restrictions for Operating System

From the OS which can be used as an operating environment, use the SW1DNC-CCBD2-B version indicated in the table for the OS shown in the following table.

OS	Version of SW1DNC-CCBD2-B
Windows NT®	Version 1.12N
Windows® 2000	
Windows® XP	Version 1.16S
Windows Vista®	
Windows Server® 2003 R2	
Windows Server® 2008	

Do not use a function added by a version newer than the support version.
Refer to the following for the installation method of the SW1DNC-CCBD2-B support version and the support manual.

(1) Installation method for supported version

The software Version 1.12N and 1.16S SW1DNC-CCBD2-B are stored in the CD-ROM of software package.
Install using "Setup.exe" from the folders shown in the following table.

Version of SW1DNC-CCBD2-B	Stored folder
Version 1.12N	\WinNT_2k
Version 1.16S	\WinXP_7

(2) Manual

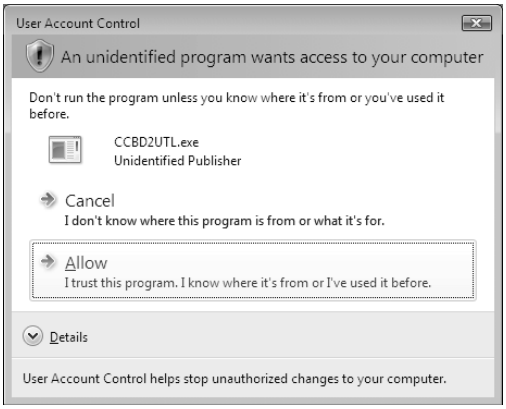
Refer to the corresponding manual for functions and handling methods of SW1DNC-CCBD2-B Version 1.12N and Version 1.16S. The manual is stored in the following folder on the CD-ROM of software package.

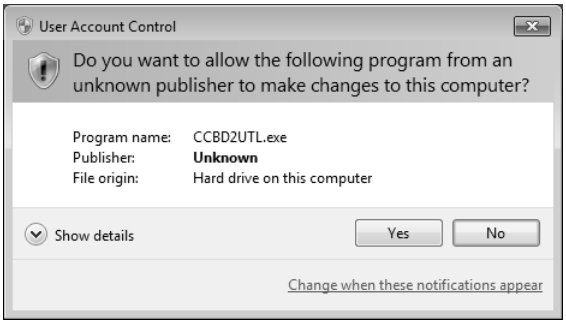
Version of SW1DNC-CCBD2-B	Manual	Stored folder
Version 1.12N	sh080527engq.pdf	\WinNT_2k\Manual
Version 1.16S	sh080527engu.pdf	\WinXP_7\Manual

Appendix 15 Warning Message Appears on Windows®

Appendix 15.1 Overview of warning message

When using an operating system with the user account control function, a warning message appears when you run the CC-Link Ver.2 utility or the Device monitor utility. (Refer to Section 8.1)


User Account Control
An unidentified program wants access to your computer
Don't run the program unless you know where it's from or you've used it before.
CCBD2UTL.exe
Unidentified Publisher
Cancel
I don't know where this program is from or what it's for.
Allow
I trust this program. I know where it's from or I've used it before.
Details
User Account Control helps stop unauthorized changes to your computer.


User Account Control
Do you want to allow the following program from an unknown publisher to make changes to this computer?
Program name: CCBD2UTL.exe
Publisher: Unknown
File origin: Hard drive on this computer
Show details
Yes
No
Change when these notifications appear

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Appendix 15.2 Methods for preventing the warning message

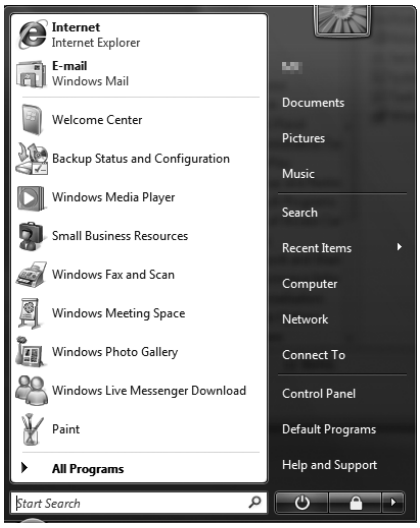
POINT
The user account control (UAC) function prevents a crash (e.g. prevention of start-up of a program which executes unintended operation). Before setting this function, grasp that the security function offered by UAC will be disabled and fully understand the risk.

The following two methods are available for preventing a warning message.

(1) Disabling the user account control function

The following shows a procedure for disabling the user account control function.

(a) Using Windows Vista® /Windows Server® 2008 /Windows Server ® 2008 R2



1) Open the Control Panel.

2) Select [User Accounts].

(To next page)

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(From preceding page)

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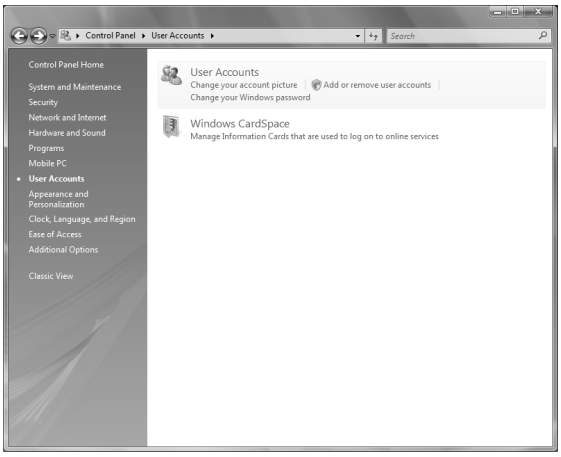
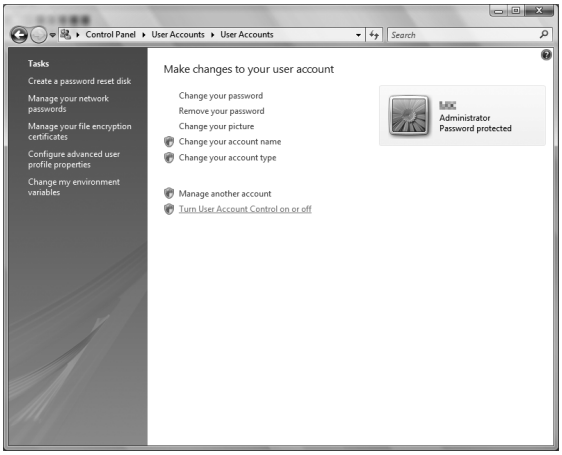


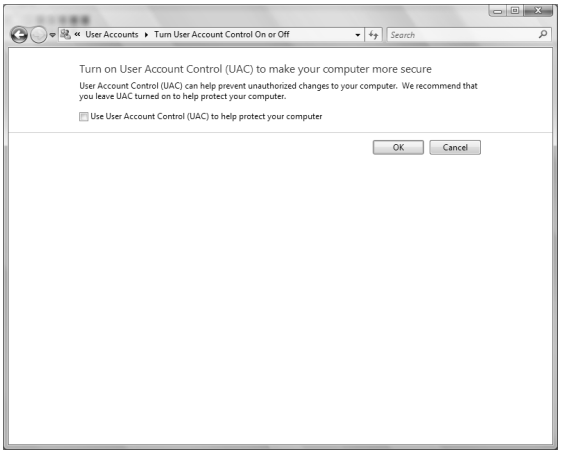
↓

3) Select [User Accounts].



↓

4) Select [Turn User Account Control on or off].


User Accounts ▸ Turn User Account Control On or Off ▸
Search
Turn on User Account Control (UAC) to make your computer more secure
User Account Control (UAC) can help prevent unauthorized changes to your computer. We recommend that you leave UAC turned on to help protect your computer.
Use User Account Control (UAC) to help protect your computer
OK
Cancel

↓

(Setting completion)

5) Deselect [Turn on User Account Control (UAC) to make your computer more secure] and click the OK button.

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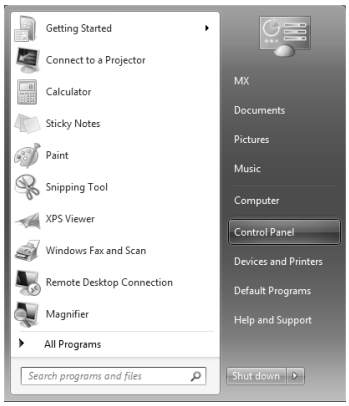
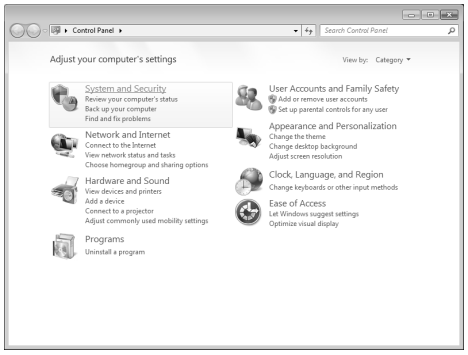
(b) Using Windows® 7/Windows Server® 2012/ Windows Server® 2012 R2/Windows® 8/Windows® 8.1



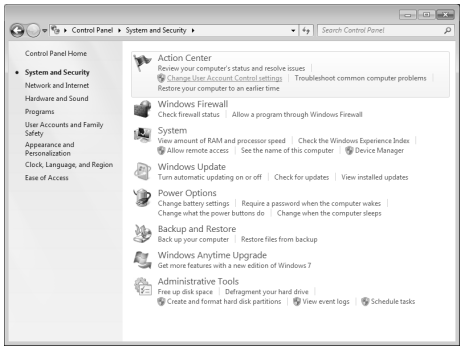
↓

1) Open the Control Panel.



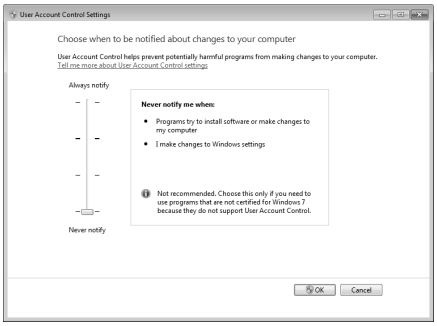
↓

2) Select [System and Security].



↓

3) Select [Change User Account Control settings].



↓

4) Set the slide bar [Never notify me when] and click the OK button.

(Setting completion)

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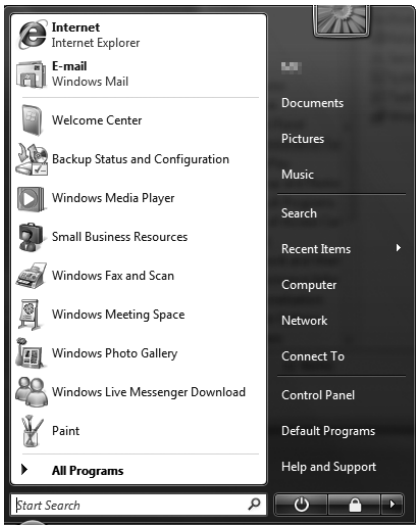
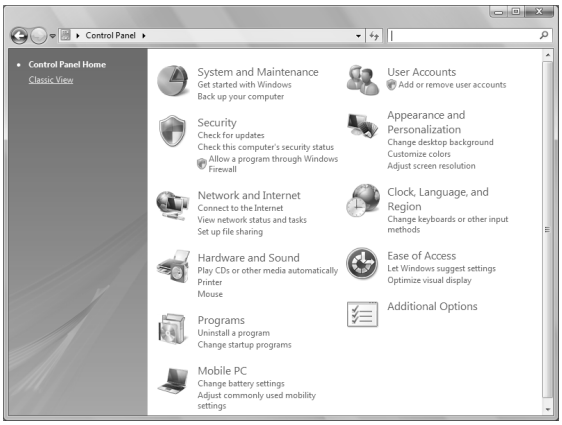
(2) Allowing the warning message without showing it

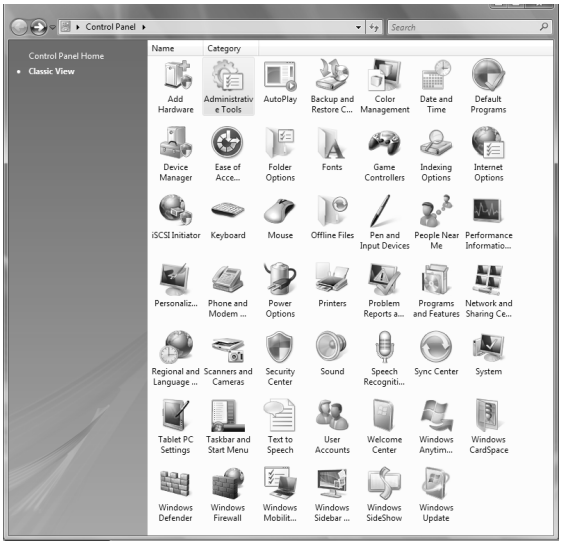
The following shows a procedure for allowing a warning message without showing it.



1) Open the Control Panel.



2) Select [System and Security] or [Classic View].



3) Select [Administrative Tools].

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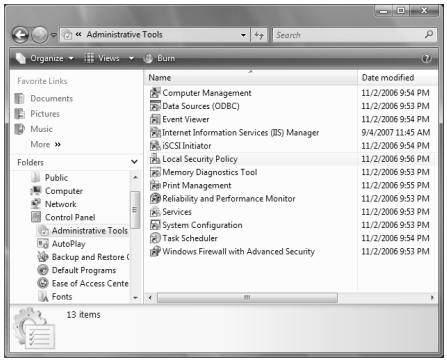
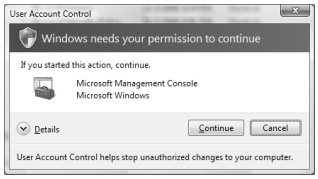


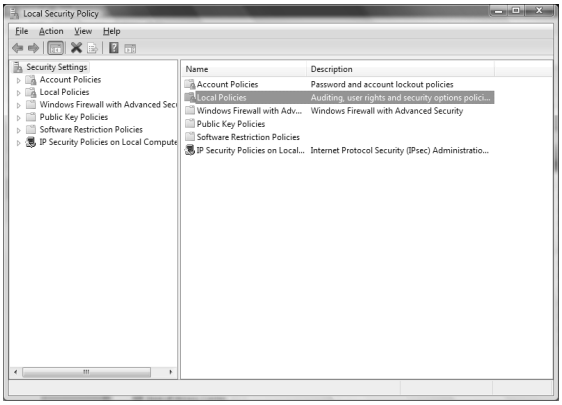
4) Select [Local Security Policy].

* When user account control is enabled, the following screen appears. Click the Continue or Yes button.



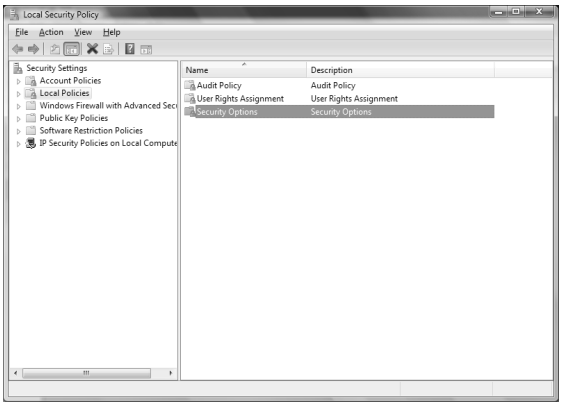
User Account Control
Do you want to allow the following program to make changes to this computer?
Program name: Microsoft Management Console
Verified publisher: Microsoft Windows
Show details
Yes
No
Change when these notifications appear

↓



5) Select [Local Policies].

↓



6) Select [Security Options].

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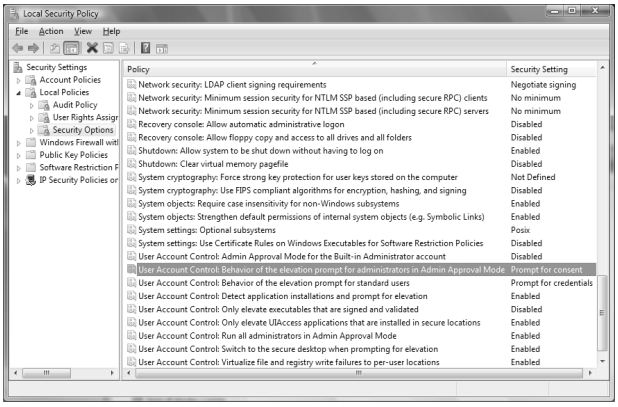
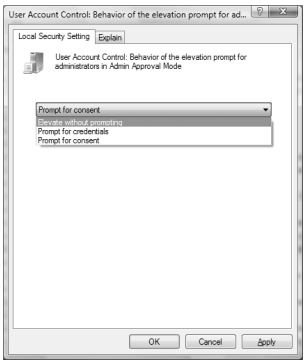

Local Security Policy
File Action View Help
Security Settings
Account Policies
Local Policies
Audit Policy
User Rights Assign
Security Options
Windows Firewall with
Public Key Policies
Software Restriction P
IP Security Policies on
Policy
Security Setting
Network security: LDAP client signing requirements
Negotiate signing
Network security: Minimum session security for NTLM SSP based (including secure RPC) clients
No minimum
Network security: Minimum session security for NTLM SSP based (including secure RPC) servers
No minimum
Recovery console: Allow automatic administrative logon
Disabled
Recovery console: Allow floppy copy and access to all drives and all folders
Disabled
Shutdown: Allow system to be shut down without having to log on
Enabled
Shutdown: Clear virtual memory pagefile
Disabled
System cryptography: Force strong key protection for user keys stored on the computer
Not Defined
System cryptography: Use FIPS compliant algorithms for encryption, hashing, and signing
Disabled
System objects: Require case insensitivity for non-Windows subsystems
Enabled
System objects: Strengthen default permissions of internal system objects (e.g. Symbolic Links)
Enabled
System settings: Optional subsystems
Posix
System settings: Use Certificate Rules on Windows Executables for Software Restriction Policies
Disabled
User Account Control: Admin Approval Mode for the Built-in Administrator account
Disabled
User Account Control: Behavior of the elevation prompt for administrators in Admin Approval Mode
Prompt for consent
User Account Control: Behavior of the elevation prompt for standard users
Prompt for credentials
User Account Control: Detect application installations and prompt for elevation
Enabled
User Account Control: Only elevate executables that are signed and validated
Disabled
User Account Control: Only elevate UIAccess applications that are installed in secure locations
Enabled
User Account Control: Run all administrators in Admin Approval Mode
Enabled
User Account Control: Switch to the secure desktop when prompting for elevation
Enabled
User Account Control: Virtualize file and registry write failures to per-user locations
Enabled

7) Select [User Account Control: Behavior of the elevation prompt for administrators in Admin Approval Mode Prompt for consent].

↓



8) Select [Elevate without prompting] on the <<Local Security Setting>>, and click the OK button.

↓

(Setting completion)

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Appendix 16 Behavior When Personal Computer Enters Power Save Mode or Fast Startup

CC-Link Ver.2 board does not support the power save mode (standby, hibernate, sleep) and the fast startup function. The following explains the behavior of the personal computer when the personal computer enters each mode.

Appendix 16.1 Behavior when the personal computer enters the power save mode (standby, hibernate)

(1) Target operating system

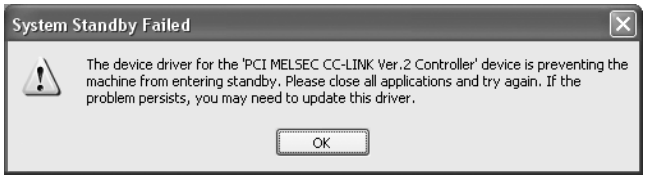
The following operating systems have the power save mode (standby, hibernate).

- Windows® XP
- Windows Server® 2003 R2

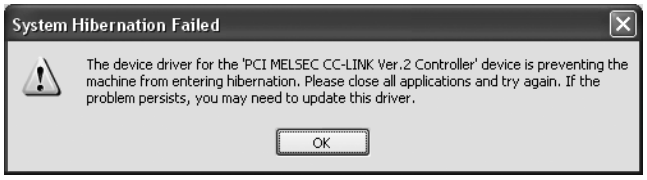
(2) Behavior when entering the standby mode/hibernation mode

When the personal computer enters the power save mode (standby, hibernate), the following message appears and the power save mode (standby, hibernate) is disabled.
The CC-Link Ver.2 board continues its operation and the data link remains normal.

<When entering the standby mode>


System Standby Failed
The device driver for the 'PCI MELSEC CC-LINK Ver.2 Controller' device is preventing the machine from entering standby. Please close all applications and try again. If the problem persists, you may need to update this driver.
OK

<When entering the hibernation mode>


System Hibernation Failed
The device driver for the 'PCI MELSEC CC-LINK Ver.2 Controller' device is preventing the machine from entering hibernation. Please close all applications and try again. If the problem persists, you may need to update this driver.
OK

(3) Countermeasure

When the personal computer is set to enter the power save mode (standby, hibernate), check and change the setting for when the computer's power button is pressed, or the settings of the uninterruptible power supply system (UPS) on the control panel.

Appendix 16.2 Behavior when the personal computer enters the power save mode (hibernate, sleep)

(1) Target operating system

The following operating systems have the power save mode (hibernate, sleep).

- Windows Vista®
- Windows Server® 2008
- Windows Server® 2008 R2
- Windows® 7
- Windows Server® 2012
- Windows Server® 2012 R2
- Windows® 8
- Windows® 8.1

(2) Behavior when entering the hibernation mode/sleep mode

The following explains the behavior of the board when the power save mode (hibernate, sleep) is entered on the personal computer.

- The CC-Link Ver.2 board stops its operation and is disconnected from the network.
- The board is not reconnected even after the personal computer returns from the power save mode (hibernate, sleep).
- After the personal computer returns from the power save mode (hibernate, sleep), "-28141(9213H) : System sleep error" occurs when accessing CC-Link Ver.2 board from the CC-Link Ver.2 utility or an application program, which includes MELSEC data link library function.

(3) Countermeasure

When the personal computer is set to enter the power save mode (hibernate, sleep), the setting is changed by MELSECPowerManager.
For details of MELSECPowerManager, refer to Appendix 17.

Appendix 16.3 Behavior when the fast startup function is enabled

(1) Target operating system

The following operating systems have the fast startup function.

- Windows Server® 2012
- Windows Server® 2012 R2
- Windows® 8
- Windows® 8.1

(2) Behavior when entering the fast startup function is enabled

The following explains the behavior of the board when the fast startup function is enabled.

- The board is not reconnected even after the fast startup.
- After the fast startup, "-28141(9213H) : System sleep error" occurs when accessing CC-Link Ver.2 board from the CC-Link Ver.2 utility or an application program, which includes MELSEC data link library function.

(3) Countermeasure

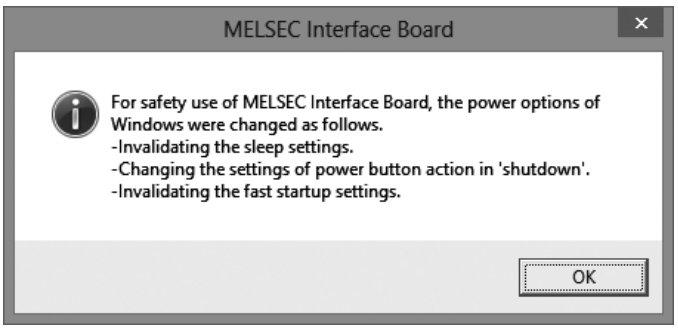
When the fast startup function is enabled, the setting is changed to disabled by MELSECPowerManager.
For details of MELSECPowerManager, refer to Appendix 17.

Appendix 17 MELSECPowerManager

MELSECPowerManager is a service application which monitors the Windows® Power Options settings every 30 seconds to prevent the personal computer from entering the power save mode (hibernate, sleep) or fast startup.
MELSECPowerManager is applicable for the following operating systems.

- Windows Vista®
- Windows Server® 2008
- Windows Server® 2008 R2
- Windows® 7
- Windows Server® 2012
- Windows Server® 2012 R2
- Windows® 8
- Windows® 8.1

When a personal computer is set to enter the power save mode (hibernate, sleep) or the fast startup function is enabled, the following message is displayed and the setting is changed by MELSECPowerManager.


MELSEC Interface Board
For safety use of MELSEC Interface Board, the power options of Windows were changed as follows.
-Invalidating the sleep settings.
-Changing the settings of power button action in 'shutdown'.
-Invalidating the fast startup settings.
OK

Appendix 17.1 Installing MELSECPowerManager

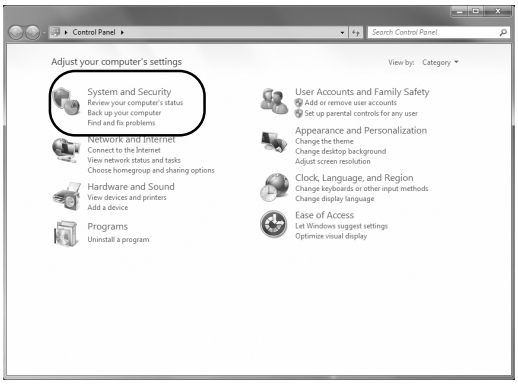
MELSECPowerManager is installed automatically when the software package is installed to a personal computer.
The operation starts after the personal computer is restarted.

Appendix 17.2 Uninstalling MELSECPowerManager

MELSECPowerManager is uninstalled automatically when the software package is uninstalled.
However, it is not uninstalled when another software package of MELSEC interface board is installed to the personal computer.
Uninstall all software packages for MELSEC interface board installed on the personal computer to uninstall MELSECPowerManager.

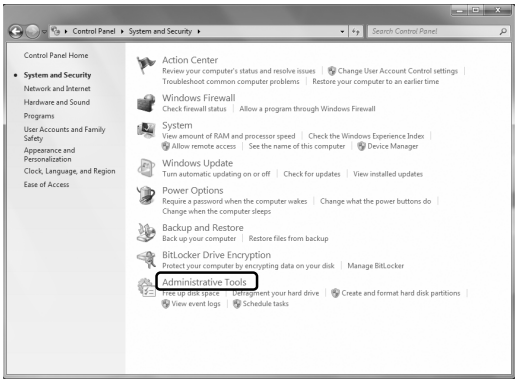
Appendix 17.3 Checking MELSECPowerManager

The following explains how to check the installation and operating status of MELSECPowerManager.
The following is a setting example when using Windows® 7.



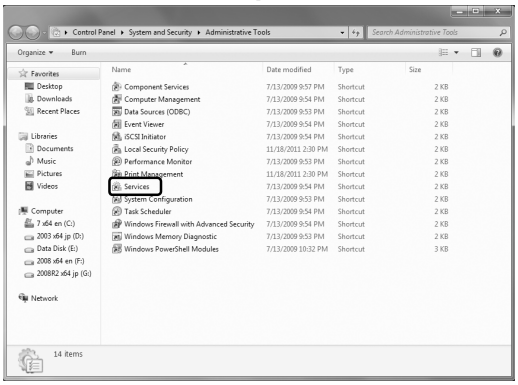
1) Open [Control Panel] [System and Security].

↓



2) Select [Administrative Tools].

↓



3) Double-click [Services].

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(From preceding page)

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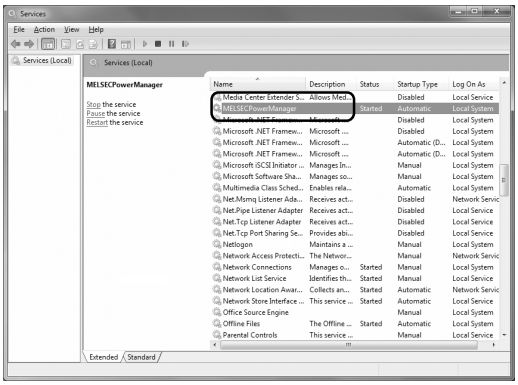


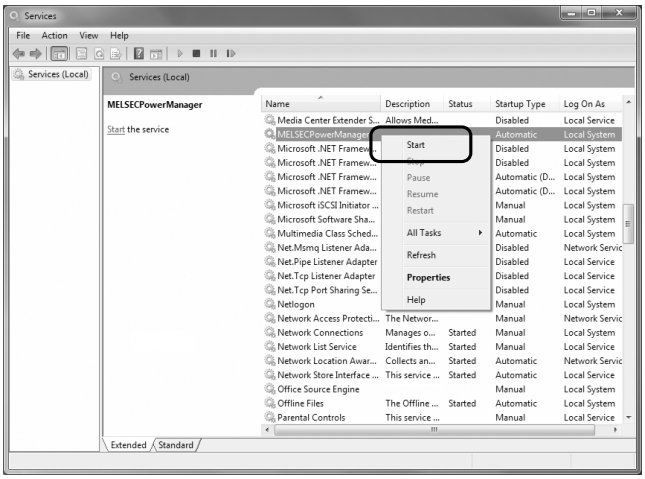
↓

(Setting completion)

4) Check if MELSECPowerManager is registered.

POINT

- When MELSECPowerManager is disabled, the personal computer may enter the power save mode (hibernate, sleep) automatically depending on the settings on the personal computer. Do not disable MELSECPowerManager because the CC-Link Ver.2 board does not function normally if the personal computer enters the power save mode (hibernate, sleep). For the behavior of the board when the personal computer enters the power save mode (hibernate, sleep) or the fast startup function is enabled, refer to Appendix 16.
- If MELSECPowerManager is disabled accidentally, right-click "MELSECPowerManager" on the "Services (Local)" screen and select "Start" from the menu.



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Appendix 18 EMC and low voltage directive

Compliance with the EMC Directive, which is one of the EU directives, has been mandatory for the products sold within EU member states since 1996 as well as compliance with the Low Voltage Directive since 1997.
To prove the compliance, manufactures must issue an EC Declaration of Conformity and the products must bear a CE marking.

(1) Sales representative in EU member states

The authorized representative in EU member states will be:
Company name : Mitsubishi Electric Europe BV
Address: Gothaer Strasse 8, 40880 Ratingen, Germany

Appendix 18.1 Requirements for Conformance to EMC Directive

The final decision on the method for the EMC Directive conformance and the application must be made by the manufacturer of the machinery. The EMC Directive sets two requirements for compliance: emission (conducted and radiated electromagnetic energy emitted by a product) and immunity (the ability of a product to not be influenced by externally generated electromagnetic energy).
This section summarizes the precautions for machinery constructed with the CC-Link Ver.2 Board to comply with the EMC Directive.
These precautions are based on the requirements of the EMC Directive and the harmonized standards. However, they do not guarantee that the entire machinery constructed according to the descriptions complies with the EMC Directive.
The manufacture of the machinery must determine the testing method for compliance and declare conformity to the EMC Directive.

(1) Standards applicable to the EMC Directive

The standards applicable to the EMC Directive are listed below.
All test items were tested by installing each device on a personal computer bearing a CE certification logo.

(a) Emission requirements

Standard	Test item	Test description	Value specified in standard
EN61131-2: 2007	CISPR16-2-3 Radiated emission*1	The electromagnetic wave which the product emits to the external space is measured.	• 30 to 230MHz, QP: 40dBμV/m (measured at 10m distance) *2 • 230 to 1000MHz, QP: 47dBμV/m (measured at 10m distance)
	CISPR16-2-1, CISPR16-1-2 Conducted emission*1	The noise level which the product emits to the power line is measured.	• 0.15 to 0.5MHz, QP: 79dB, Mean: 66dB *2 • 0.5 to 30MHz, QP: 73dB, Mean: 60dB

∗1: The tests were conducted installed in a control panel.
∗2: QP: Quasi-peak value, Mean: Mean value

(b) Immunity requirements

Standard	Test item	Test description	Value specified in standard
EN61131-2: 2007	EN61000-4-2 Electrostatic discharge immunity*1	An electrostatic discharge is applied to the enclosure of the equipment.	• 8kV Air discharge • 4kV Contact discharge
	EN61000-4-3 Radiated, radio-frequency, electromagnetic field immunity*1	An electric field is radiated to the product.	80% AM modulation @1kHz • 80 to 1000MHz: 10V/m • 1.4 to 2.0GHz: 3V/m • 2.0 to 2.7GHz: 1V/m
	EN61000-4-4 Fast transient burst immunity*1	Burst noise is applied to power lines and signal lines.	• AC/DC power, I/O power, and AC I/O (unshielded) lines: 2kV • DC I/O, analog, and communication lines : 1kV
	EN61000-4-5 Surge immunity*1	Lightning surge is applied to power lines and signal lines.	• AC power, AC I/O power, and AC I/O (unshielded) lines: 2kV CM, 1kV DM • DC power and DC I/O power lines: 0.5kV CM, 0.5kV DM • DC I/O, AC I/O (shielded), analog, and communication lines: 1kV CM
	EN61000-4-6 Conducted RF immunity*1	High-frequency noise is applied to power lines and signal lines.	0.15 to 80MHz, 80% AM modulation @1kHz, 10Vrms
	EN61000-4-8 Power-frequency magnetic field immunity*1	The product is immersed in the magnetic field of an induction coil.	50/60Hz, 30A/m
	EN61000-4-11 Voltage dips and interruption immunity	Power voltage is momentarily interrupted.	• 0%, 0.5 period, starting at zerocrossing • 0%, 250/300 period (50/60Hz) • 40%, 10/12 period (50/60Hz) • 70%, 25/30 period (50/60Hz)

*1: The tests were conducted installed in a control panel.

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(2) Installing devices in the control panel

Installing devices in the control panel has a considerable effect, not only securing safety but also shielding the noise generated from the personal computer in the control panel. ∗

∗: Also, each network remote station needs to be installed inside the control panel. However, the waterproof type remote station can be installed outside the control panel.

(a) Control panel

- Use a conductive control panel.
- Mask off the area used for grounding when securing the top or bottom plate to the control panel using bolts.
- To ensure electrical contact between the inner plate and the control panel, mask off the bolt installation areas of an inner plate so that conductivity can be ensured in the largest possible area.
- Ground the control panel with a thick ground cable so that low impedance can be ensured even at high frequencies.
- Keep the diameter of the holes on the control panel to 10cm or less. If the diameter is larger than 10cm, electromagnetic wave may be emitted. In addition, because electromagnetic wave leaks through a clearance between the control panel and its door, reduce the clearance as much as possible. Use of EMI gaskets (sealing the clearance) can suppress undesired radiated emissions.

  The tests by Mitsubishi were conducted using a control panel having the damping characteristics of 37dB (maximum) and 30dB (average) (measured at 3m distance, 30 to 300MHz).

(b) Wiring power and ground cables

The power supply cable and ground cable for a personal computer should be laid out as follows:

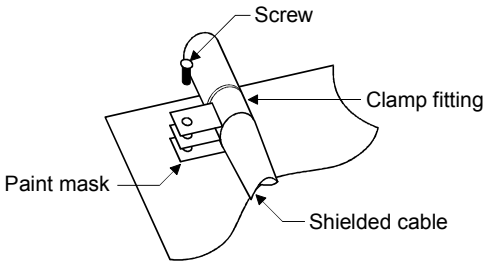
- Provide a ground point to the control panel near the power supply module. Ground the FG terminal of the personal computer and the SLD terminal of the CC-Link Ver.2 board to the ground point with the thickest and shortest ground cable possible (30cm or shorter).
- Twist the ground cable leading to the ground point with the power supply cable. By twisting it with the ground cable, the noise leaking from the power supply cable may be grounded at a higher rate. However, twisting the power supply cable with the ground cable may not be necessary if a noise filter is installed on the power supply cable.

(3) Cables

Use a shielded cable for the cable extended out of the control panel.
If a shielded cable is not used or not grounded correctly, the noise immunity will not meet the required value.

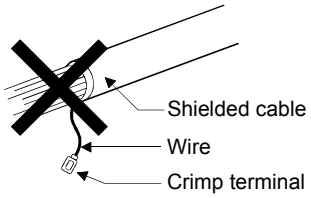
(a) Grounding of shielded of shield cable

- Ground the shield of the shield cable as near the exit as possible from the control panel.
  If the ground point is not near the outlet, the cables after the ground point will cause electromagnetic induction, and will generate a higher harmonic noise.
- Peel part of the shielded cable's sheath, and ground a wide section of the exposed shielded section against the control panel.
  Clamp fittings can be used as shown below. Note that the painting on the inner side of the control panel, against which the clamp fitting is contacted, must be masked.



POINT

The method of grounding by soldering a wire onto the shield section of the shielded cable as shown below is not recommended. The high frequency impedance will increase and the shield will be ineffective.



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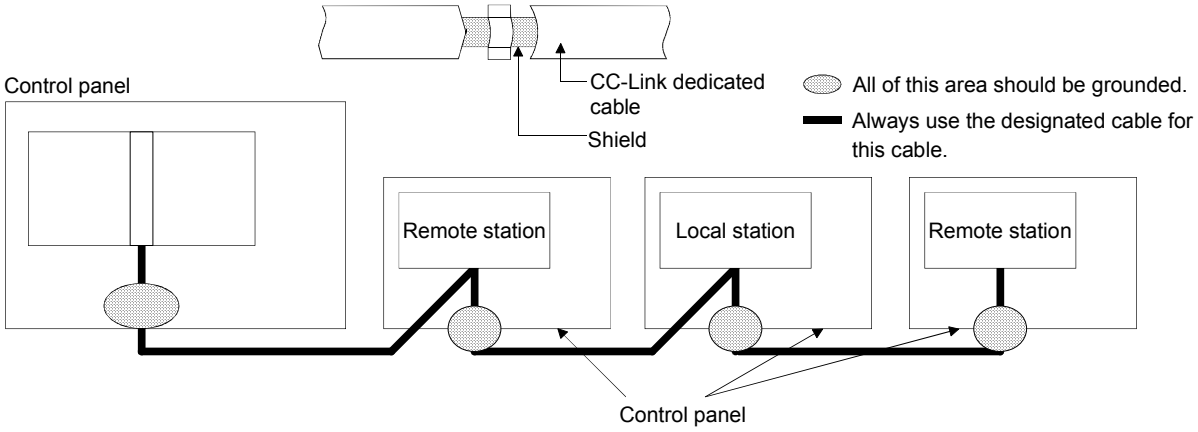
(b) CC-Link dedicated cable

- Always ground the CC-Link dedicated cable connected to the CC-Link system master station, local station and remote station.
  Since the CC-Link dedicated cable is a shielded cable, remove a part of the outer sheath. Then ground the exposed part of the shield indicated in the figure below using as wide a surface area as possible.

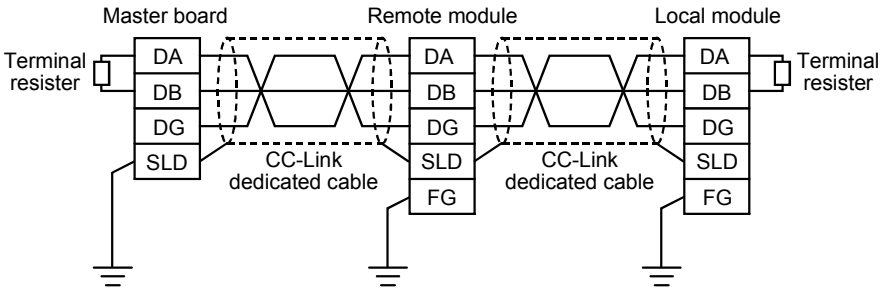


Furthermore, the grounding should be made within 30 cm (11.81 in.) of the CC-Link Ver.2 board terminal area and at the position closest to the exit of the control panel.

- Always use the specified CC-Link dedicated cable.

- Do not use a ferrite core for the CC-Link dedicated cable coming from each module and the CC-Link Ver.2 board.

- Ground the SLD terminal of the CC-Link Ver.2 board.
  Ground the FG terminal of each module.



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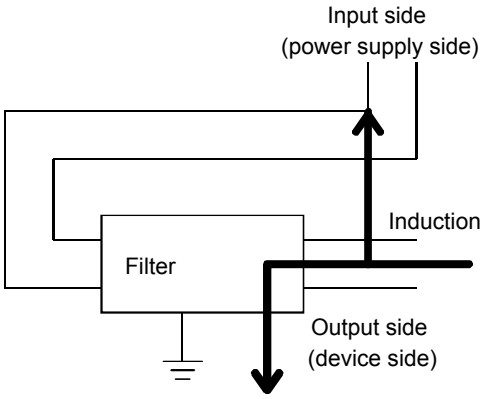
(4) Noise filter (power supply line filter)

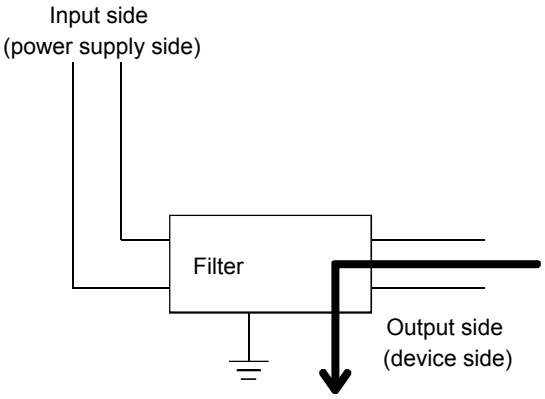
Noise filter is effective for reducing conducted noise in the 10MHz or less frequency. (Use of a noise filter can suppress noise.)

The installation precautions are described below.

- Do not bundle the cables on the input side and output side of the noise filter. If bundled, the output side noise will be induced into the filtered cable on the input side.



Noise will be induced when the input and output cables are bundled.



Separately install the input and output cables.

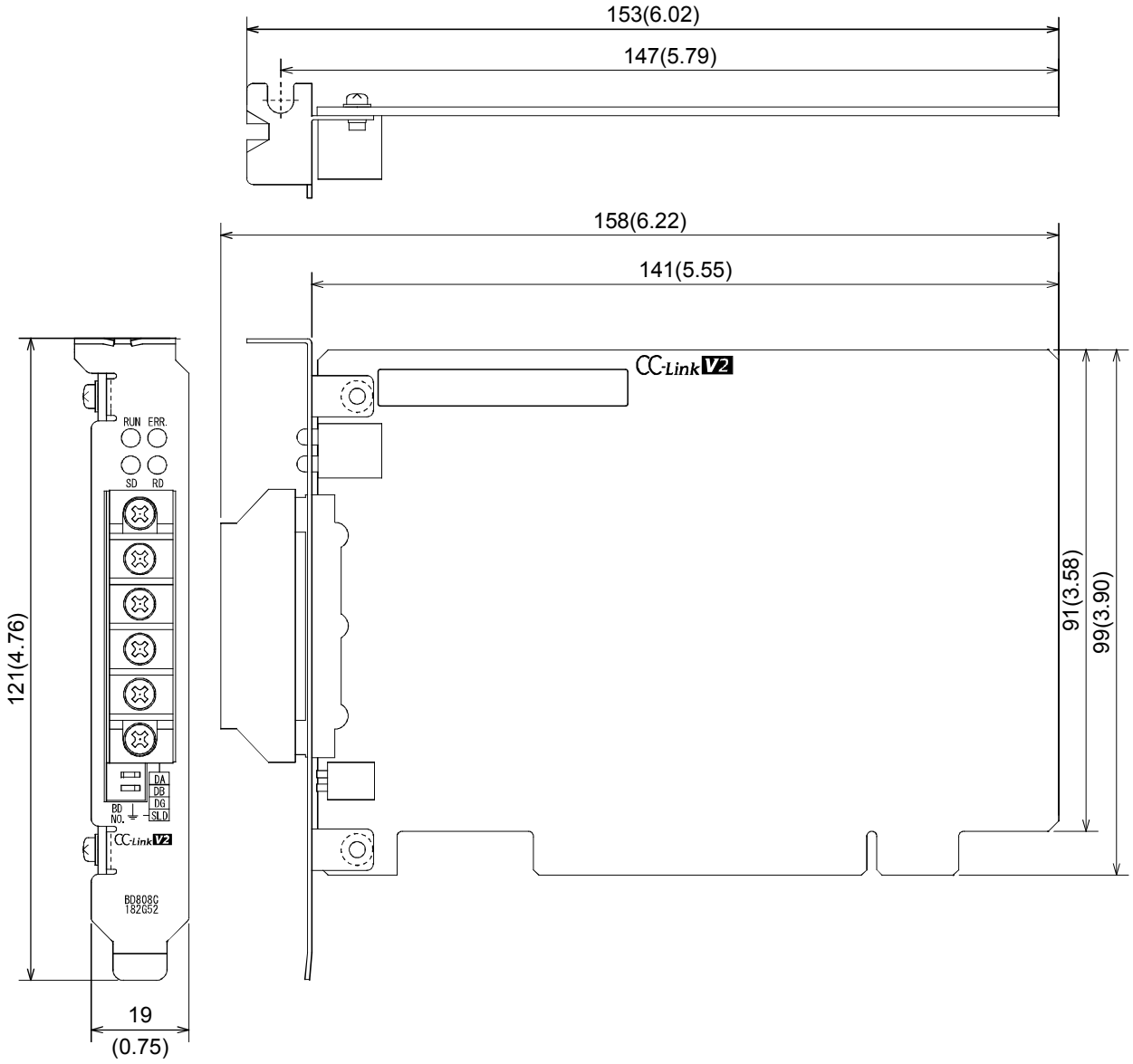
- Ground the ground terminal of the noise filter to the ground point of the control panel using as short wiring as possible (approximately 10cm).

Appendix 18.2 Requirements for Conformance to Low Voltage Directive

The CC-Link Ver.2 board is out of the requirement for conformance to the Low Voltage Directive, since it does not use the power supply in the range of 50 to 1000V AC and 75 to 1500V DC.

Appendix 19 External Dimensions

Appendix 19.1 Q80BD-J61BT11N



Unit mm (inch)

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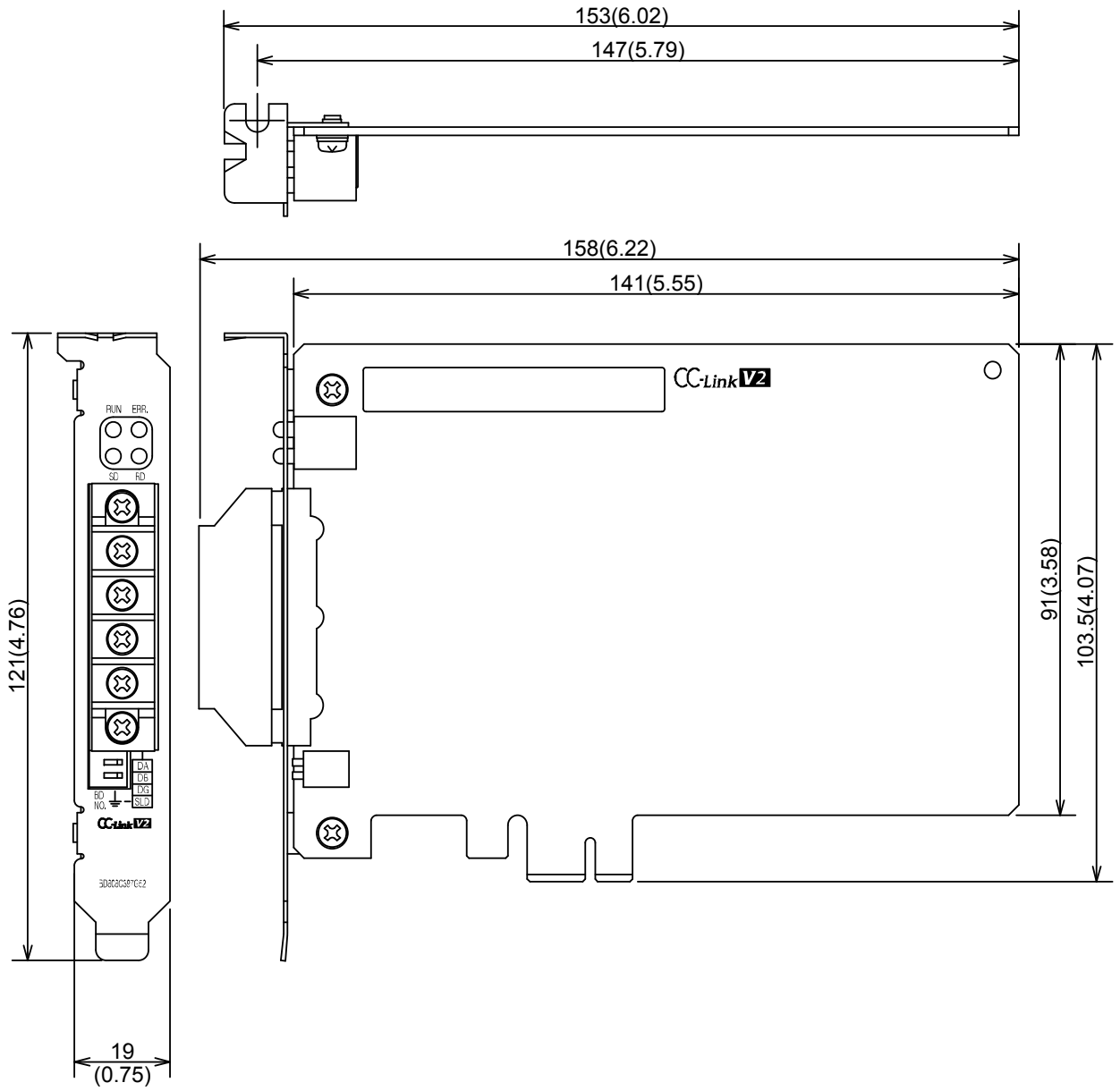
Appendix 19.2 Q81BD-J61BT11



Unit mm (inch)

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WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.
However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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MODEL: Q80BD-BT11N-SW1-U-E
MODEL CODE: 13JR77

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NAGOYA WORKS : 1-14 , YADA-MINAMI 5-CHOME , HIGASHI-KU, NAGOYA , JAPAN

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